THE INDEPENDENT GUIDE TO IBM PERSONAL COMPUTERS

PC

Volume 3 Number 15
$2.95

August 7, 1984

In PC News: Compaq's Desktop

Framework And Symphony Face Off

MDE

New Power For your IBM

NewWord:
WordStar Double
At Half the Price

Price Waterhouse
Report:
Great Plains Software

DATA BASE 7 Programmable
Database Managers

Kaypro 4 Plus 88 and
Sharp PC-5000:
Two Paths to
Portability

0 14024 14355 32

"I DON'T MEAN TO BRAG, BUT EVERY-ONE IN MY COM-PANY AGREES I MAKE THE MOST HEAVENLY PIES IN THE WORLD."

Somebody has to be better than everybody else.

It's inevitable.

Somebody is always more determined. Works harder. And winds up on top.

Take Dysan, for instance.

We were the ones who helped develop the first 5¼" flexible diskette.

And while everybody else was trying to figure out how to make them, we were busy making them better.

With superior materials. A special lubricant and jacket liner that extend diskette life.

Unique manufacturing techniques. Like our burnishing process that helps eliminate read/write errors.

And an almost fanatical corporate commitment to quality.

What does all this mean to you?

Every Dysan diskette you buy will record and retain all your data all the time. For as long as you own the diskette and treat it right.

Dysan.

We're not just like everybody else.

Dysan 5¼" and 8" flexible diskettes are available at your computer products dealer.

Call toll free for the name of the Dysan dealer nearest you. (800) 551-9000.

Dysan Corporation, 5201 Patrick Henry Drive, P.O. Box 58053, Santa Clara, CA 95050, (408) 988-3472.

Dysan®

CIRCLE 243 ON READER SERVICE CARD

Dysan is a registered trademark of Dysan Corporation © 1984, Dysan Corporation

DEFY THE LAWS OF ECONOMETRICS.

Somewhere it is written that large-scale econometric applications require large computers. That the necessary speed and accuracy are available only on a mainframe.

It is also accepted that econometric software must be difficult to learn and complex to use. And that sizeable monthly time-sharing fees are a simple fact of life.

With all due respect to these principles of the past, we proudly present what's new: ESP,™ The Econometric Software Package™ from Alpha Software.® It's a full-scale, fast and highly accurate IBM® PC and XT version of the well-known ESP mainframe program.

And it's already been selected for use by Chase Econometrics, Prudential-Bache and New York Telephone, among others.

Why? Because nothing of the mainframe program is sacrificed. You get the analytical tools you need for sophisticated modeling and forecasting. Nearly all accepted statistical and regression techniques are at your command in one truly powerful program.

In fact, ESP from Alpha is actually enhanced with features like built-in graphics and advanced data management. Plus, ESP interacts like the best personal computer software—with a spontaneous, natural feel that's instinctive, and easy to grasp. It even has on-line help and tutorials.

ESP lets you download from any major data bank including Chase and DRI. Or move your own data from other PC software like 1-2-3,® Multiplan,® dBASE II,® and our own Data Base Manager II.™

But what's best is ESP gives you nearly instant results. Any analysis is performed before your eyes. Models, forecasts, scenarios—as many as you'd like, as often as you'd like, any time you'd like. At no incremental cost.

ESP™
The Econometric Software Package™

And you pay just $795 for ESP from Alpha.

For more information and a demonstration version of ESP, send $5.00 to Alpha Software Corporation, 30 B Street, Burlington, MA 01803. Or call us at 1-800-451-1018 (In Massachusetts call 1-800-462-2016).

ALPHA® SOFTWARE CORPORATION

ESP and the Econometric Software Package are trademarks licensed to Alpha Software Corp. by MIKROS Corp. IBM is a registered trademark of International Business Machines Corp. 1-2-3 of Lotus, Multiplan of Microsoft, and dBASE II of Ashton-Tate. Data Base Manager II is a trademark of Alpha Software Corp. Alpha Software Corp. is a registered trademark. © 1984 Alpha Software Corp.

CIRCLE 195 ON READER SERVICE CARD

AT LAST. SOFTWARE SO REVOLUTIONARY IT WON'T CHANGE THE WAY YOU WORK.

Introducing the first software ever designed to work just like people. Instead of the other way around.

It's called Electric Desk™ from Alpha.® And it's the only software you can buy that actually lets you move instantly from one job to another—from a letter to a memo to a budget to a customer list, over to a stock report and back—all with a couple of keystrokes.

Try that with other software and you'll end up switching disks, reading and writing files, switching disks again, waiting, worrying, trying to remember different commands for different software packages. Not very natural.

But with Electric Desk, virtually all the computer power you need—including word processing, spreadsheet, data base and communications—can all be going at the very same time. All from a single program with one set of easy commands.

You can even split your screen into windows and work on two jobs at once. Or shoot information from one file to another in a flash. Not even the most expensive integrated packages work as quickly or as well. And what's best is Electric Desk is so easy to learn and use, many people never even look at the manual.

So take your choice. Go with other software and change the way you work. Or go with Electric Desk and change the amount of work you get done. See it now at your Alpha Software Dealer or call us for more information at 1-800-451-1018 (in Massachusetts call 1-800-462-2016).

Electric Desk—Integrated Productivity Software for the IBM® PC, XT and PC*jr*.

ALPHA® SOFTWARE CORPORATION

Electric Desk is a trademark licensed to Alpha Software Corp. by Electric Software, Inc. Alpha Software Corp. is a registered trademark. IBM is a registered trademark of the International Business Machines Corp. © 1984 Alpha Software Corp.

Alpha Software Corporation, Burlington, Massachusetts

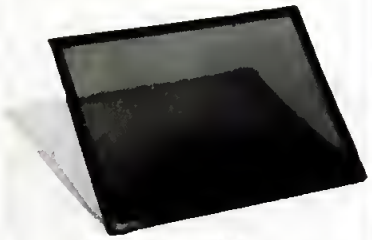
CIRCLE 194 ON READER SERVICE CARD

NO REFLECTIONS ON YOU!

with the
SDC ANTIGLARE SCREEN

Look at the face of your CRT Its smooth surface reflects light like a mirror Room lights, windows, the keyboard, even your hands, clothing and jewelry may be visible in it Prolonged exposure to these distracting reflections causes eyestrain and unnecessary fatigue

The **ANTIGLARE SCREEN** from Screen Data Corporation has been judged by an independent insurance company study to be the best solution tested to eliminate glare Factors considered were user productivity, reduction of fatigue, ease of cleaning, durability, adaptability and cost



The **ANTIGLARE SCREEN** is not glass or plexiglass but a finely woven mesh of tough synthetic material The mesh passes text and graphics information from the CRT through to the eyes while stopping light from other sources from reflecting back to you At the same time, the appearance of the display is enhanced because characters appear against a dark rather than a light background

The **ANTIGLARE SCREEN** can be attached in moments, Velcro buttons permit easy removal No tools or disassembly of your display is required Over 200 sizes are available to fit most displays

The **ANTIGLARE SCREEN** is only 39 95 postpaid Try it for 30 days You must be completely satisfied or your money will be refunded Most popular sizes are in stock for next day shipment Be sure to specify whether you have a monochrome or color display

NEW Power screen™ WITH SDC ANTIGLARE

The static field in front of the tube causes dust, smoke and pollen particles to move about more freely and increase eyestrain, irritability and fatigue The new conductive **POWER SCREEN** completely discharges this static field A metal strap connects it to chassis ground

The **POWER SCREEN** is just 49 95 with the same 30 day satisfaction guarantee

ORDER LINE
MC VISA COD
800-531-5273
(In Texas)
512-250-8757
Dealer Inquiries Invited

SDC
SCREEN DATA CORPORATION
DEPT. CSC
240 CEDAR KNOLL ROAD
CEDAR KNOLLS, NJ 87927

CIRCLE 447 ON READER SERVICE CARD

PC
The Independent Guide to IBM Personal Computers

PUBLISHER	Jeff Weiner
EDITOR	Bill Machrone
EXECUTIVE EDITORS	Mike Edelhart, Connie Winkler
MANAGER, COPY EDIT	Anne Freed
MANAGING EDITOR	Barry Owen
SPECIAL PROJECTS EDITOR	Paul Somerson
TECHNICAL EDITOR	Craig Stark
ASSISTANT MANAGING EDITOR	Susan Hurley
SENIOR COPY EDITOR	Jennifer de Jong
ASSOCIATE EDITORS	Barbara Krasnoff, Stephanie Stallings
TECHNICAL ASSISTANT	Michael O'Cone
PRODUCTION EDITOR	Paul Ross
ASSISTANT EDITORS	Jean Atelsek, Karen Cook, Lisa Kleinman, James Langdell, Janet Lewis, David Obregón, Fredric Paul
EDITORIAL ASSISTANTS	David Baker, Cheryl Goldberg, Nina Kirschner, Jane Mintzer, Roz Tobias
OFFICE MANAGER	Iris Knittel
CONTRIBUTING EDITORS	Richard Aarons, Frank J. Derfler, Jr., Will Fastie, Stephen Manes, Peter Norton, Martin Porter, Winn L. Rosch, Corey Sandler, Jared Taylor, Robin Webster
PROOFREADERS	Gerald Carney, Michael Espindle
EXECUTIVE ART DIRECTOR	Mitch Shostak
ART DIRECTORS	Mary Zisk, Gerard Kunkel
ART EDITOR	Mariano Nicieza
ASSISTANT ART DIRECTORS	Rosalyn Migdal, Louine White
MECHANICAL ARTIST	Ilisa Goodheart
PRODUCTION ARTISTS	Susan Ahlman, Eddie Baumgarten, Annette Fournet
SUBSCRIPTION DIRECTOR	Chet Klimuszko
TELEMARKETING MANAGER	Linda Rossiter
NEW BUSINESS MANAGER	Eric A. Bernhard
RENEWAL AND BILLING MANAGER	Shane Boel
DIRECT RETAIL SALES	Gerald Grossman
ADVERTISING COORDINATORS	Helen Forgeue, Scott E. Pearl
DISTRICT MANAGERS	
NORTHERN CALIFORNIA and NORTHWEST	David Riegler (415) 594-2290
SOUTHERN CALIFORNIA	Barbara Farkas (213) 387-2100
NEW ENGLAND and NEW YORK	Ellen Atkinson (212) 725-7947
MIDWEST	John Hemsath (312) 346-2600
MIDATLANTIC and SOUTHEAST	Bob Ostrow (212) 725-7947
ACCOUNT SALES MANAGER	Pauline Scherer
ACCOUNT REPRESENTATIVES	Jane Anderson, Lisa Kamplman, Kathy Krochta, Tom Leibacher, Anne Robbins, Jan Schultz, Patty Schwartz, Pam Sigal
ASSISTANT to the PUBLISHER	Mary Alice De Paola
ADVERTISING OFFICE	Ziff-Davis Publishing Company, One Park Avenue, New York, NY 10016 (212) 725-7947
FOUNDER	Anthony Gold

CONSUMER COMPUTERS & ELECTRONICS MAGAZINE DIVISION

PRESIDENT	Larry Sporn
VICE PRESIDENT MARKETING	J. Scott Briggs
VICE PRESIDENT CIRCULATION	Carole Mandel
VICE PRESIDENT GENERAL MANAGER	Eileen O. Markowitz
VICE PRESIDENT LICENSING AND SPECIAL PROJECTS	Jerry Schneider
VICE PRESIDENT, CREATIVE SERVICES	Herbert Stern
CREATIVE DIRECTOR	Peter J. Blank
DESIGN DIRECTOR	Brian Day
EDITORIAL DIRECTOR	Jonathan D. Lazarus
MARKETING MANAGER	Ronni Sonnenberg

ZIFF-DAVIS PUBLISHING

President Richard P. Friese, **President, Consumer Magazine Division** Albert S. Traina; **Executive Vice President, Marketing and Circulation** Paul H. Chook; **Senior Vice President** Phillip T. Heffernan; **Senior Vice President** Sidney Holtz; **Senior Vice President** Edward D. Muhlfeld; **Senior Vice President** Philip Sine, **Vice President** Baird Davis, **Vice President** George Morrissey; **Vice President** Rory Parisi; **Vice President** William L. Phillips, **Treasurer** Selwyn Taubman, **Secretary** Bertram A. Abrams

PC The Independent Guide to IBM Personal Computers ISSN (#0745-2500) is published bi weekly for $34 97 for one year (26 issues) $61 97 for two years, and $81 97 for three years. Additional postage $44 00 for Canada and all other foreign countries. PC Communications Corp., a subsidiary of Ziff-Davis Publishing Co., One Park Ave., New York, NY 10016. Second-Class postage paid at New York NY 10016 and at additional mailing offices POSTMASTER Address changes to *PC The Independent Guide to IBM Personal Computers*, P O Box 2445, Boulder CO 80322 **Editorial and Business Office:** One Park Ave., New York NY 10016 Editorial (212) 725-4694, Advertising (212) 725-7947 For subscription inquiries and service, write to PC Magazine, P O Box 2445 Boulder CO 80322 *PC* is an independent journal, not affiliated in any way with International Business Machines Corporation IBM is a registered trademark of International Business Machines Corp

Entire contents Copyright © 1984 PC Communications Corp All rights reserved reproduction in whole or in part without permission is prohibited The following are trademarks of PC Communications Corp PC, PC The Independent Guide to IBM Personal Computers, PC Mart, PC Lab, PC-Communiques, Project PC, PC Tutor, PC BlueBook User-to-User, PC News **Permissions:** Material in this publication may not be reproduced in any form without permission Requests for permission should be directed to Jean Lautenbach, Ziff Davis Publishing Company, One Park Ave., New York, NY 10016 Editorial Communications may be addressed to SOURCE BBB343, CompuServe 71226,713, or MCI Mail 157 9301

BPA

REALWORLD EXPERIENCE

THERE IS NO SUBSTITUTE

RealWorld™ Business Software

For Most Popular Microcomputers

Courtesy Fred Oster, Vintage Instruments

Photograph Joseph Nettis

ACCOUNTS RECEIVABLE☐ORDER ENTRY☐INVENTORY CONTROL
SALES ANALYSIS☐ACCOUNTS PAYABLE☐GENERAL LEDGER☐PAYROLL

Whatever the product or service, it takes experience to produce quality and lasting value.

There are no inexperienced master violin makers. And so it is with software.

The staff at RealWorld Corporation have been creating packaged software products for nearly ten years. During that time, over 40,000 users have kept us in touch with reality.

We don't sell "disposable software". We haven't tried for the fanciest packaging. We won't promise "anyone can master it in ten minutes".

Mature accounting software just isn't like that.

But we will say this:

If your accounting needs are typical, and if you are willing to invest the time to read and follow our clearly written instruction manuals, RealWorld Software can work for you.

Visit your local computer store for more information, or call one of our 800 numbers for the authorized reseller nearest you.

mbsi™ *A Division of RealWorld Corporation*

DOVER ROAD, CHICHESTER, NH 03263

603/798-5700 TOLL FREE: 800-255-1115

California: 800-441-1777 Western U. S.: 800-321-1777

CIRCLE 420 ON READER SERVICE CARD

PC
The Independent Guide to IBM Personal Computers

VOLUME 3, NUMBER 15
AUGUST 7, 1984

page 152

COVER STORIES

Framework: An Outline for Thought 118
Don Layman/An early look at *Framework*, Ashton-Tate's long-awaited integrated windowing package. Best described as an idea processor, this package gives "word people" an outlining function that is the equivalent of the number cruncher's electronic spreadsheet.

Symphony: A Community of Information 128
Edward Baras/Lotus Development Corporation has coordinated five functions to create a unique integrated package. While *Symphony* in many ways rounds out its predecessor, *1-2-3*, it includes many new features to give the package added power.

FEATURES

HARDWARE
The Sharp PC-5000: A First-Class Traveling Companion 140
Roland Racko/Sharp's lap-size PC-5000 offers desktop power at a competitive price. Weighing 13 pounds with its optional built-in printer, this battery-operated unit contains enough internal memory to perform serious spreadsheet analysis, text processing, or code development.

CP/M and DOS: At Home in the Kaypro 4 Plus 88 152
Barbara Krasnoff/The Kaypro 4 Plus 88 may not be physically attractive, but it offers a workable combination of CP/M with some degree of DOS compatibility at a reasonable price.

SPECIAL REPORT
Project: Database, Part 5 159
A continuation of our seven-part investigation of the database packages available for your PC. Here's a review of the first batch of Category 3 products—those with a procedural language.

THE PRICE WATERHOUSE REPORT
Inventory Management for Retailers 213
GPS' *Inventory Management with Point of Sale Invoicing* system allows retailers to handle sales transactions quickly and efficiently at the checkout counter while the customer is waiting.

SOFTWARE
NewWord: A WordStar Double at Less than Half the Price 226
Dara Pearlman/This *WordStar* clone may give MicroPro a run for its money as it competes head to head against the industry giant on price and performance. How well does Rocky Mountain Software Systems' *NewWord* compare?

New Power for Constructing Financial Models 242
George C. Hayles/The *ENCORE!* financial modeling language package from Ferox Microsystems can handle problems too complex for a spreadsheet.

LANGUAGES
Better Business BASIC 251
David Whitehouse/A review of Applications BASIC (AB86) from Soft Gold, Inc., and Thoroughbred Operating System from SMC Software Systems, a duo of new interpreters for the versatile Business BASIC language. Although the packages are similar for programmers, they are two very different animals for end users.

The BASIC for Professionals 265
Don George/Morgan Computing implements a new version of the BASIC language that corrects some deficiencies of the original and adds strong visual programming and debugging tools.

page 140

page 213

PRO COLUMNS

SCIENCE
Micro-biology 295
Dean Madar, M.D./MICROBE, a program for keeping track of patient specimens and results, puts a microcomputer to work handling a microbiology lab's information-management tasks.

EDUCATION
Trainerless Training: Drifting Off Course 299
Harold Goldes/A new training package from Cdex has so much straight text and allows so little user input that it might as well be in printed form. Cdex has lost sight of the principles of interactive courseware.

MEDICINE
The PC Remedy for a Hospital's Ills 303
Edward Joyce/Here's the story of how a Texas health-care center survived its trial-by-fire transition to an in-house computer system.

BUSINESS
Micro Insurance 309
Jeffrey Lener/Insurance companies offer ways to insure the computers that you and your company depend on against common and not-so-common hazards.

PROGRAMMING
Get SET for Speed 353
Gregg Weissman/Speed up your DOS command and filename entries with the SET command and the environment feature.

WRITING
A Publisher's Circulation File 379
Terry Ulick/A publisher uses a database program to build a circulation-management file tailored to the highly detailed requirements of the Postal Service.

DEPARTMENTS

WHAT'S INSIDE 15

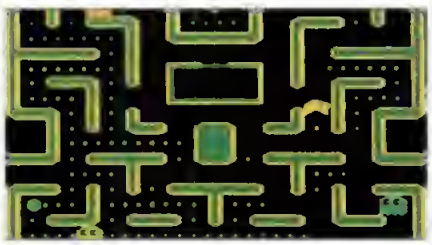
PC NEWS 35
Twelve pages of up-to-the-minute reports, interviews, minireviews, and useful tips, along with entertaining tales and fables from the computer community.

FROM THE EDITOR'S SCREEN
New Product Love 81
Bill Machrone/Introducing a new product can be like a courtship—of the public, the press, retailers, and distributors. Its progress can perhaps best be described in the poetic metaphors of John Donne.

GUEST EDITORIAL
A Satisfying Way to Deal with Bugs 87
Steve Sall/How to convince a manufacturer to fix a buggy program.

LETTERS TO PC 91

THE NORTON CHRONICLES
A Modest Proposal on Compatibility 103
Peter Norton/Norton continues to ruminate on software compatibility and proposes a dream solution to the problem.



PC ARCADE
Hardhats and Bows 277
Corey Sandler/*Hard Hat Mack* strives to be computer game pop art, while *Ms. Pac-Man* really is "more than *Pac-Man* with a bow."

BOOK REVIEW
The Fruits of Technology: Stressing Solutions 285
Roy Katz and Eric Berg/Are you in danger of suffering from "technostress"? Can you squeeze just a little more out of *WordStar?* Two new books attempt to give you the answers.

NEW ON THE MARKET 313
David Obregón/The latest in hardware, software, accessories, publications, and services, complete with company addresses and telephone numbers, prices, and technical requirements.

PC BLUEBOOK 330
A quick reference guide for PC owners and soon-to-be owners.

CLUB NEWS 345
Susan Hurley/Listings of dozens of IBM PC user groups.

PC:MART 348

PRODUCT INDEX 365

USER-TO-USER 368
Paul Somerson/PC owners share their tips and short programs.

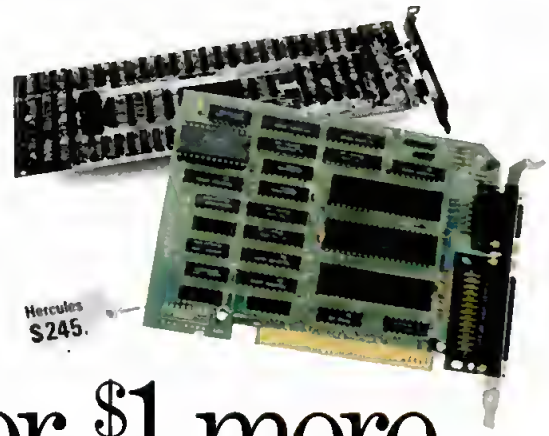
PC TUTOR 375
Mark Zachmann/PC answers readers' technical and nontechnical questions about personal computing.

INDEX TO ADVERTISERS 393

COMING UP
PCjr 387
PC Tech Journal 388
PC Disk 391
PC Magazine 397

Cover Photograph: Dennis Chalkin

The new HERCULES Color Card gives you the parallel port IBM® forgot–for $1 more.



And it fits into the XT's short slot.

The new Hercules Color Card gives you these five important features.

1. A parallel printer port. If you buy IBM's color card, you won't get a parallel port for a printer. Ugh. You've just wasted a valuable slot for an extra printer card.

2. It's short. Our new Color Card uses advanced gate array technology to reduce the chip count by 30 and use less than half the board space IBM does. Which makes the new Hercules Color Card perfect for the short slot in an XT.

3. Fully IBM compatible. Any program that runs on IBM's color card will run on the new Hercules Color Card. With RGB or composite video, any IBM compatible monitor will work too.

4. Hercules Graphics Card compatible. If you have a Hercules Graphics Card (model GB101 or later), or plan to buy one, an ingenious software switch on our new Color Card allows both cards to be kept in the system at the same time.

5. Low price. At a suggested list price of $245, the new Hercules Color Card has all these features for only $1 more than IBM's color card.

Call for our free information kit. See why the company that made the first graphics card for the IBM PC still makes the best.

Hercules. We're strong on graphics.
800 255 5550 Ext. 420

Address: Hercules, 2550 Ninth St., Berkeley, CA 94710 Ph: 415 540-6000 Telex: 754063 **Features:** 2 year warranty **Foreign distributors:** Compuserve/Canada; Reflex/U.K.; Computer 2000/W. Germany; Edisoft/France; SourceWare/Australia. Trademarks/Owners: Hercules/Hercules Computer Technology; IBM/International Business Machines.
Suggested List Price as of 2.22.84 for the IBM Color Graphics Adapter.

No other financial software even comes close.

Introducing Financier II

Now you can have a completely integrated financial software system.

Now Financier II
The financial software that has met with resounding approval from professional software reviewers just got even better. Now, the Financier Personal Series has been upgraded to Financier II. Combined with Financier's Tax Series and Investor's Series, it creates a totally integrated financial management system. Financier II is so easy to use that it is ideal for personal finance yet powerful enough, and flexible enough, to function as a small business system.

"It is clear that the Financier Personal Series is the most sophisticated and flexible of the financial programs under review here."

Burton Alperson, Ph.D.
Reviewer, SOFTALK

Financier II features enhanced graphics capabilities, and expansion of Financier's unique auto-checking capability which prints checks directly from a user-maintained database, while updating bank, budget and tax records. Additionally, it provides a full range of professional-caliber financial statements including net worth, and cash flow reports. You can even opt for double-entry accounting methods, if desired.

"[illegible] Financier [illegible] Personal Series [illegible] Apple [illegible] Kendall [illegible] A [illegible] February 1983

Financier II is remarkably easy to use.
You don't have to be a computer whiz-kid to use Financier II. That's because it's menu-driven. When you need to enter data, just fill in the blanks on the pre-formatted screen. If you can use an automatic teller machine, you're well on your way to mastering this unique financial software.

Another thing that puts Financier II so far in front of any other financial software package is that it offers powerful tax and inventory functions. In fact, Financier II allows you to maintain literally thousands of these accounts, if you desire. And, each account is separately manageable.

"This [illegible] software company has created Financier's [illegible] bookkeeping and financial tax [illegible] package Tax Carryforward [illegible] year record keeping [illegible] personal [illegible]

Augustin Hedberg
Money, June, 1983

Financier Tax and Investor's Packages.
Financier's Tax and Investor's Series provide the perfect adjunct to Financier II.

Financier's Tax Series lets you create multiple tax cases, and store them for later adjustment. You can even perform "what-if" spreadsheet calculations, generate graphics and print charts.

Financier's Investor Series is a comprehensive portfolio management system that lets you maintain a data base on each security account, each security position, and each security transaction.

Financier Offers Something for Everyone.
Individuals, businessmen, tax preparation specialists, investors or anyone who wants real financial control cannot afford to miss out on Financier's powerful software packages.

Get the most from your personal computer with the financial software that does the most. Financier II, and Financier's Tax and Investor's Series.

FINANCIER
WE'LL KEEP YOU ONE STEP AHEAD

For more [illegible] Inc. [illegible] Wood Road, Box 670, Westford, MA 01[illegible] (617) 366-0[illegible]

Apple [illegible] Finance™ Perfin™ PC/PFP™ Home Accountant Plus™ Financier Personal Series
**Bonus Accounting Systems [illegible] Financier Personal Series™ FMS II™ Home Accountant Plus™ Money Maestro™
Financier Software is available for IBM® PC, IBM® XT, Digital Rainbow™ and Wang® PC

CIRCLE 241 ON READER SERVICE CARD

Can Your Word Processor Keep Up With Your 100 WPM Typist?

It can if you have WordPerfect!

Try this test. While using your favorite word processor, put the cursor in the middle of a paragraph, turn insert on, and type. Surprisingly, very few of the leading word processors can keep up with 70, 60, or even 50 words per minute. WordPerfect keeps up easily at speeds well above 100*.

Now, maybe this doesn't matter to you, because you don't type 100 or even 50 WPM. But you still don't want to wait forever to go to the beginning of your document, go to page 5, save your document, or add a paragraph.

At SSI anything less than fast is unacceptable. And not just because time is money, or because wasting time is foolish.

Delays are very frustrating, and frustration can easily lower the quality of your writing.

Try WordPerfect.

WordPerfect

You'll love it—not only for the features we've built in, but also for the delays we left out.

*Based on tests performed on an IBM PC.

SATELLITE SOFTWARE INTERNATIONAL

288 WEST CENTER STREET, OREM, UTAH 84057 (801) 224-4000 TELEX 820-618

SSI

CIRCLE 149 ON READER SERVICE CARD

Qubie' gives you the three Pluses: Quality, Service, & Low Prices

"+++"

We were tempted to headline this ad with "The 1, 2, and 3 of why you should buy AST from Qubie'." We are as tired of ads with that logo as you are, so we settled on "+++." Actually, the plus really tells it better. The AST Research plus of quality is the reason they have the number one expansion products for the IBM PC. The Qubie' Plus of service has made us the largest dealer for AST products. You don't supply the likes of IBM, Exxon, General Motors, and Lockheed, unless you have premier products and service. Top it all off with low, Qubie' prices, and you have the reason tens of thousands of corporations, institutions, and PC owners have come to Qubie' for expansion products.

Take Your Choice

We have the range of multifunction boards for IBM PC's and compatibles that gives you the choice of functions right for your needs. The AST research MegaPlus II™ is the most flexible expansion product available for the PC. Its younger brother, SixPakPlus™ is the standard the competition measures themselves against. I/O Plus II™ is the answer for those who need serial and printer ports and automatic time and date loading, but already have their memory needs satisfied. MonographPlus™ is a multi-function monochrome graphics board. It offers the high resolution of the IBM monochrome board, along with flicker-free 1-2-3™ graphics, clock/calendar, printer port, and optional serial port. Standard with all four is the award winning AST SUPERPAK software. You get SUPERDRIVE™ electronic disk emulation and SUPERSPOOL™ print spooling software. All are backed with a 1 year parts and labor warranty.

MegaPlus II™			I/O Plus II™		
$229 Includes:	Options:		$149 Includes:	Options:	
Clock calendar with battery back up	64k memory	$99	Clock calendar with battery back up	Game Port	$35
Asynchronous communications port (RS232C serial COM1 or 2)	2nd async port	$39	Asynchronous communications port (RS232C serial COM1 or 2)	Printer Port	$39
Memory sockets for up to 256K	Printer port	$39	Memory sockets for up to 256K	2nd Async Port	$35
AST SuperPak Software & Q Quick Menu	GamePak	$40	AST SuperPak Software & Q Quick Menu		
	MegaPak 256b	$299	One year Parts & Labor warranty		
	MegaPak 384b	$199			
SixPakPlus™			**MonographPlus™**		
$329 Includes:	Options:		$449 Includes:	Options:	
Clock calendar with battery back up	64k memory	$99	IBM PC compatible Monochrome Card	Serial port	$39
Asynchronous communications port (RS232C serial COM1 or 2)	Game Option	$39	720 x 348 1-2-3™ compatible graphics		
Memory sockets for up to 384k			Clock calendar with battery back up		
Parallel Printer Port (LPT) or 2)			Parallel Printer Port		
AST SuperPak Software & Q Quick Menu			AST SuperPak Software & Q Quick Menu		

The Qubie' Plus

You can't be successful without providing good service. It starts with answering your questions before and after you buy. Since we only sell a few selected items, we have the information and the inventory to help you fast. We will ship your order the day after you call. And we're just as ready when something goes wrong. We will repair your board within 48 hours in our service department—not just be a relay point to the manufacturer.

Free Extras Too

The Qubie' Plus also means no cost extras like the Qubie' bracket which allows ribbon cables to be mounted without interfering with other expansion slots. Or the Q-Quick Menu™ which provides easy arrangement of Superdrive's and the size of your SuperSpool printer buffer, without having to remember how the commands work. Both are Qubie' exclusives at no extra cost to you. And it's offering extra service when you need it like our PREFERRED CUSTOMER PLAN. For $50 extra the plan offers 24 hour repairs on warranty work, and gives you a second year of warranty coverage.

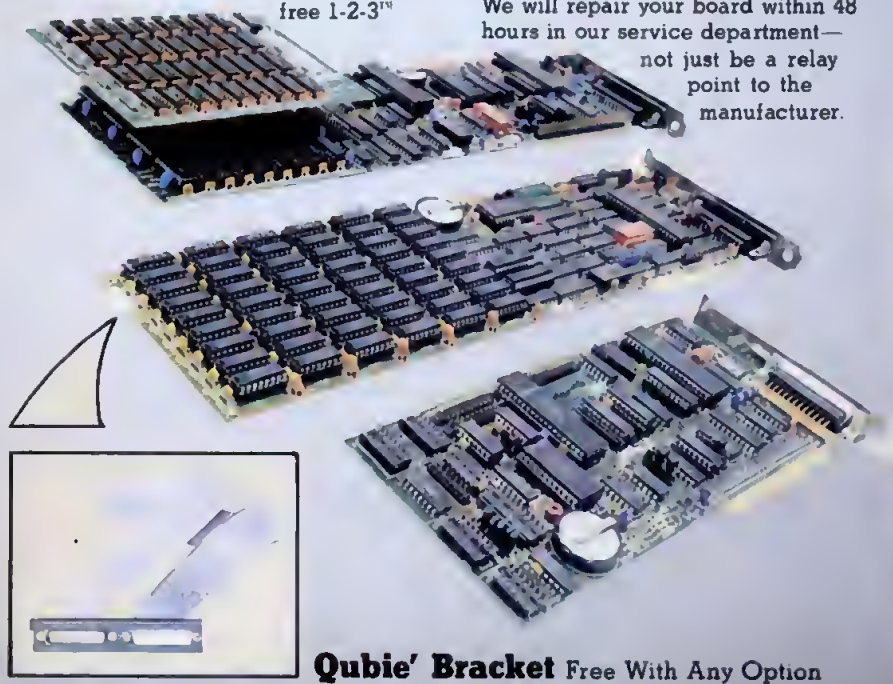
Don't Forget The Bottom Line

If you feel compelled to skim through the magazine and make a strict price comparison, remember, our price is the whole price. No extra charges for shipping, insurance, credit cards, or COD fees. In a hurry? UPS 2nd day air service is just $5 extra.

The Acid Test

If you are not completely satisfied with any Qubie' product after 30 days, you can return it for a full refund. We will even reimburse you for the postage to return it. If you can get any of our competitors to give you the same guarantee, buy any other board you think compares and return the one you don't like. We know which one you'll keep.

IBM is a trademark of International Business Machines Corporation
AST is a registered trademark of AST Research Inc



Qubie' Bracket Free With Any Option

Order Today, Shipped Tomorrow!

All prices include UPS surface freight and insurance. Add $5 for two day air service. For fastest delivery send certified check or credit card. Personal checks take 18 days to clear. Calif. residents add 6% sales tax. Corporations and Institutions call for purchase order details.

(800) 821-4479
Toll Free Outside California

(805) 987-9741
Inside California

QUBIE'

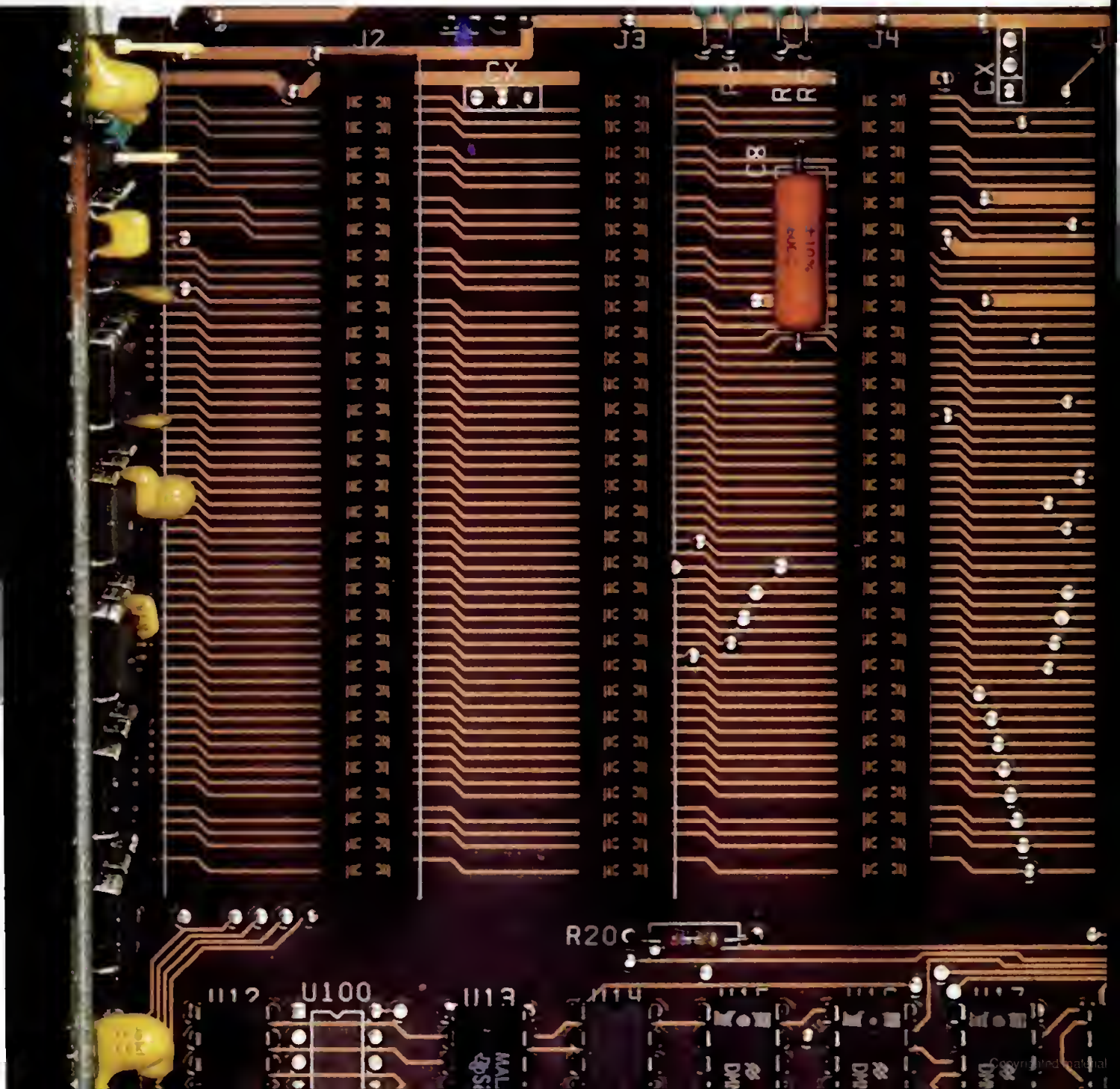
4809 Calle Alto
Camarillo, Ca. 93010

Tempo House, 15 Falcon Road,
London SW11 2PH, United Kingdom

Copyright Qubie' 1984

CIRCLE 334 ON READER SERVICE CARD

THE MOST IMPORTANT DECISION YOU WILL MAKE ABOUT YOUR IBM PC IS WHAT TO PUT INTO THESE SLOTS.



Copyrighted material

QUADBOARD BRINGS OUT THE BEST.

What you get out of your IBM PC or XT is only as good as what you put in. So put in a Quadboard, the multifunction board guaranteed to bring out the best.

Quadboard was the industry's first multifunction board and its experience shows. It's the most useful enhancement you can make to your system. Quadboard gives your PC power that the others can't.

EXPANDABLE TO 384K

THE SOFTWARE MASTER.

Part of the Quadboard's success is QuadMaster II, the best utility software package around. It's the one that's regularly updated to help you get the most from the Quadboard's features. There's no other combination that offers you more.

And remember, with 10 of the most needed PC functions combined into one board, Quadboard doesn't waste any space. It leaves you with lots of slots free for future expansion.

THE PERFECT "10."

You get all this in the one and only Quadboard:

1. **Memory expansion to 384K** in increments of 64K with full parity checking standard.
2. **A parallel port** perfect for operating most printers and other parallel devices (addressable as LPT1 or LPT2).
3. **A serial port** (RS-232C adapter) that is software programmable for baud rate, character stop and parity bits. Use it for connecting plotters, modems, letter quality printers and other serial devices.
4. **A game port** for plugging in a joystick or game paddles.
5. **An I/O bracket** that snaps onto the back of your PC to help organize expansion port connectors.
6. **A battery powered chronograph** to keep the system's internal clock/calendar up-to-date.
7. **QuadRAM Drive,** included as part of QuadMaster II software, can be used to set up multiple RAM drives in memory.
8. **MasterSpool,** part of QuadMaster II software, can be used to set up a software print buffer.
9. **Qswap,** another feature of QuadMaster II software, lets you change line printers 1 and 2 back and forth as often as you like.
10. **MasterCache** a disk caching system that speeds up any program that frequently reads data from a disk, such as word processors or electronic spread sheets.

QUADRAM QUALITY™

A QUALITY DECISION.

Quadboard is the number one option board for the IBM PC. It's first because it's the best. That means performance, dependability and reliability. It all adds up to Quality, from Quadram. A company you can count on today. And tomorrow.

Before you fill another slot, consider Quadboard by Quadram. It's the best board for the job.

QUADBOARD®

THE PERFECT DECISION

QUADRAM™
An Intelligent Systems Company

4355 International Blvd./Norcross, Ga. 30093
(404) 923-6666/TWX 810-766-4915 (QUADRAM NCRS)

© COPYRIGHT 1984 QUADRAM CORPORATION
ALL RIGHTS RESERVED
QUADBOARD IS A REG. TRADEMARK OF QUADRAM CORPORATION

IBM PC, and IBM PCXT are registered trademarks of International Business Machines Corporation.

INTERNATIONAL OFFICES
Interquadram Ltd. 442 Bath Road, Slough, England SL1 6BB Tel 6286-63985 Tlx 847155 Auriema G **Interquadram GmbH** Fasanenweg 7 6092 Kelsterbach, West Germany Tel 6107-3089 Tlx 417770 Seva G **Interquadram s.a.r.l.** 41, Rue Ybry, 92522 Neuilly Tel 758-1240 Tlx 630842 Iso Bur **Chevco Computing** 6581 Kitimat Road Mississauga, Ontario, Canada L5N-2X5 Tel 416-821-7600

CIRCLE 203 ON READER SERVICE CARD

Textra™ word processing

The shortest distance between your thoughts and the printed word.

Your thoughts come faster than your words. Capturing them smoothly and quickly is the strength of Textra, and the secret behind its success.

Textra blends advanced features with a simplified design that makes it easier to write with your personal computer. And that's what word processing is all about.

Start with the 'on-line' tutorial, which has been called everything from elegant to excellent. It's the finest introduction to a software program ever filmed. You'll be ready to write in record time.

And Textra will be ready for you. Its highly responsive full screen editor helps you put your thoughts on the screen swiftly. Automatic reformatting and on-screen bolding and underlining show you what your printed text will look like at all times. You can even preview your pages *before* they're printed, so you only have to print them once!

Whether you're searching for your first word processor, or feel miserable with the one you have now, take a close look at Textra. Ask your dealer for a demonstration today.

It's guaranteed to open your eye.

Ann Arbor Software

Textra runs on the IBM PC and compatibles and requires PCDOS (any version), 128K, and either monitor.

407 N. Main, Ann Arbor, MI 48104 Phone (313) 769-9088
© 1983, Ann Arbor Software. All rights reserved.

CIRCLE 117 ON READER SERVICE CARD

What's Inside

While PC's editors were making peace with the magazine's writers, a major battle was looming between Framework and Symphony, two new pace-setting integrated software packages.

All indications to the contrary, *PC Magazine* really does like its writers. Oh, we on the staff may nag them a little about style; we may drive them slightly berserk when we have to cut their original manuscripts to ribbons; and we may even cause them to suffer minor nervous breakdowns when we're forced to give them assignments with 3-day deadlines—but in spite of it all, we really do appreciate the trouble they go through to help fill our magazine every 2 weeks.

So, in an attempt to assure our writers that we are doing all that for their own good (and ours) the editors of *PC* decided to give a party—or, more appropriately, a short conference—at which all our assorted free-lancers could gather, meet each other and the staff of *PC*, and find out something about the in-house workings of the publication. After all, even if we do assemble the best technical writers around for *PC Magazine*, why assume they can't use a little improvement?

It all happened last May 21st, in the portals of New York City's nicely old-fashioned Sheraton Russell Hotel, replete with deep carpeting and dark wood paneling. Approximately 50 writers congregated in the Sheraton Room early on that Monday morning, loaded themselves up with pastry and coffee (you can't get a writer to come to anything unless there's something available to eat), and settled

down to about 5 hours of *PC* Day.

First, the members of *PC*'s editorial staff introduced themselves so that they would no longer be disembodied voices on the telephone. A little back-patting was offered by editor Bill Machrone and editorial director Jonathan Lazarus; then, we got down to business.

The assembled guests learned how the magazine is progressively put together by the writers, editors, art, and production; about how *not* to write an article ("I opened the package with trembling hands, my heart fluttering as I wondered what changes in my life the software would make . . ."); and about who our readers are and what they want out of *PC*.

Did all that good advice "take"? Will our free-lancers go home and do us proud? It's up to you to let us know.

Cover Story

One of the main purposes of this column, of course, is to explain how our cover stories get to be our cover stories. Most of the time, the process is fairly simple and not terribly exciting: the heads of the editorial and art departments meet, go over what stories are upcoming, and try to decide which of them is worth featuring on the cover of *PC*. The process is very calm, cool, and correct, in the highest tradition of professional comportment.

This issue's cover story, on *Framework* vs. *Symphony*, however, was the result of a bit more excitement than usual. It all started when editor Bill Machrone got a phone call from Marty Mazner, the president of Forefront, the company that developed the first half of the cover story. "What would you think," asked Mazner, "of a product that does for people who use words what spreadsheets do for people who use numbers?" Machrone wanted to hear more. "It's a do-all product," he was told. "It can put documents in spreadsheets, put graphs in cells, intermix them, and then manipulate the whole thing."

Later, when Mazner and Rob Carr, the author of the program, brought *Framework* to the *PC* offices, it was assumed

Photography: Dennis Chalkin

that, being just one of the hundreds of new software packages brought to our offices, it would be viewed no differently than all the other packages by special-projects editor Paul Somerson and Machrone.

But that wasn't the way it worked out. Around the office, everything stopped. Jon Lazarus was called down from the administrative offices, and executive editors Mike Edelhart and Connie Winkler were quickly drawn into the office. They looked at the demos, went out to lunch, and then looked again.

Mazner also mentioned that *Framework* was going to have "some backing from Ashton-Tate." But nothing prepared us for the huge amounts of hype and marketing expertise that would be brought to bear on the product introduction.

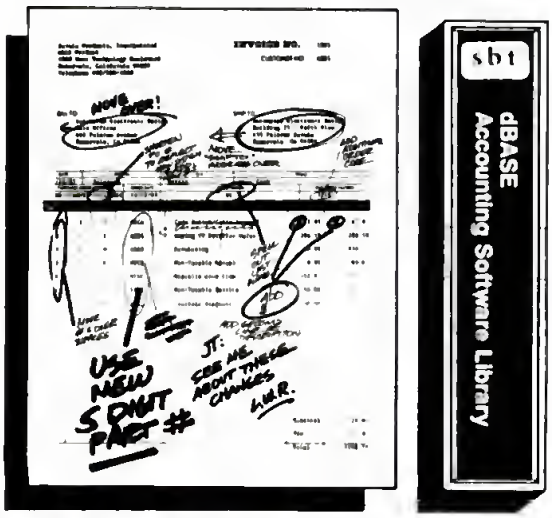
Meanwhile, around the time of the February Softcon, Lotus announced the introduction of *Symphony*, an expanded version of the company's popular *1-2-3* package. *Symphony*, too, was intended to set a new standard, and Lotus planned an elaborate ad campaign of its own (including Victor Borge and a symphony orchestra). Like *Framework*, Lotus' new program also stimulated interest and curiosity within *PC*'s editorial halls.

We quickly realized that the competition between *Symphony* and *Framework* was going to provide software users with an interesting spectacle. This impression was solidified at Atlanta's Spring COMDEX, where the Lotus and Ashton-Tate booths were placed directly adjacent to each other in the main exhibit hall. The two companies squared off and glared at each other like two technological knights preparing for battle.

Intrigued, we set two of our best writers to the task of dissecting both packages and reporting on what they found. Don Layman, head of a computer consulting firm, had to finish his article on *Framework* at the same time he was racing to finish his reviews of Category 3 database packages. Meanwhile, Ed Baras, who took a close look at *Symphony*, was well acquainted with Lotus programming even before he took on the assignment—he already has a book out on using *1-2-3*.

Which of the two integrated combatants will be left once the smoke has cleared? Or will *Symphony* and *Framework* both grab an appreciable part of the software market? Only time—and competition—will tell. ■

SOURCE CODE INCLUDED...



for a change!

Because the dBase® Source Code is included with all SBT Accounting Software, you can add a special part number system or change a report format at will—the possibilities are endless. You get control and flexibility that's crucial to a well run business. What's more, every SBT Accounting Program can change and grow with your needs. You can make the changes yourself, or SBT will do it for you quickly and inexpensively.

Completely Integrated

Start with the modules you need now, and add the others later. Best of all, SBT Software works on all computers that can run dBase.

.dOrder	Sales Order Processing	$195
.dInvoice	Billing/Inventory	$195
.dStatement	Accounts Receivable	$ 95
.dPurchase	Purchase Order Processing	$195
.dPayable	Accounts Payable	$295
.dPayroll	Payroll/Labor Accounting	$395
.dLedger	General Ledger/Finance	$395
.dAssets	Asset/Depreciation	$195
.dProject	Project/Job Accounting	$345

Demonstration disks available.
Call SBT at 408-980-8880 for more information.

Now Available for dBase III™

sbt CORPORATION
1140 Mountain View-Alviso Rd.
Sunnyvale, California 94089

*dBase II is a registered trademark of Ashton Tate

CIRCLE 470 ON READER SERVICE CARD

Nothing retrieves information faster than our librarian-in-a-box™

- *For speedy search and retrieval of your word processing text files.*
- *For effective disk/diskette management.*

Your computer-stored library of text information is a valuable asset... but only if you can find the exact text you need, when you need it. Trouble is, as you put information into your hard disk and floppies, it becomes increasingly difficult to find the text you need relating to a specific topic.

The solution? Your personal librarian, whom you can count on to find the exact text...and all the text...relating to whatever topic you need.

Now ZyLAB offers that librarian-in-a-box...for rapid retrieval of important information. It's called ZyINDEX.™ Because ZyINDEX™ automatically keeps track of the location of every word in your documents, it makes "key word" text retrieval systems obsolete. To retrieve information, you simply tell ZyINDEX which words or combinations of words you want. ZyINDEX gets it all in seconds.

ZyINDEX also works with files from public databases, such as Dow Jones and CompuServe, and other programs such as Lotus 1-2-3.

Fill in the card today, or call, to order ZyINDEX.

VISA

MasterCard

30-DAY MONEY-BACK GUARANTEE

- ZyINDEX Standard—$145. Search 500 to 3,000 documents, depending on the search capabilities you choose.
- ZyINDEX Professional—$295. Offers ten times greater capacity.

(Both require DOS 2.0 or higher, and minimum 192K)

ZyLAB™
Corporation
233 East Erie, Chicago, IL 60611

800 544 6339

V·C·N EXECUVISION™

The Presentation Graphics Program™ from Prentice-Hall, Inc.

How you present your message is just as important as *what you present* in today's competitive environment. That's why so many executives, managers, salespeople, and professionals in every field, from doctors to attorneys...teachers to architects are relying more and more on visual presentations to convey their complex ideas and information.

Now there is an incredibly advanced software program that will allow you to create professional quality graphic presentations right on your IBM PC or IBM XT. VCN ExecuVision, from the Business and Professional Division of Prentice-Hall, brings the power of a complete graphic arts department to your computer. *In minutes*, you can create exciting presentations that previously would have taken days, or weeks, for an art department to complete. Presentations that you can run directly on your computer monitor or with an overhead projection screen...or convert to hard copy or slides.

VCN ExecuVision is the ideal tool for meetings, new business proposals, consulting symposia, educational/training programs, marketing plans, management reports, or virtually any other professional presentation.

Automatically plotted charts and graphs are just the beginning. You'll have access to hundreds of *pre-drawn* images and clip art from special add-on graphics libraries created specifically to add visual impact.

- Graphically frame your most important ideas and information with artwork from the *The Border Collection.*
- Use *The Initials & Decorative Design Collection* to emphasize key words or phrases in your text.
- From production lines to executive *Business Collection.*
- Add the human touch to presentations by including representations of people from *Professions: The Faces and Figures Collection.*
- Images from all over the world are at your fingertips in the *International Symbols & Landmarks Collection.*
- Give your data geographic perspective and impact with images from *The Maps and Regions Collection.*

Each library contains both full screen images and partial screens (pixes). You can use the entire image, or, with the electronic CUT AND PASTE program function, use just a detail from the full screen. You can modify or enhance the images, mix and match them, choose from 64 possible color combinations... you can even set the images in motion across the screen using VCN ExecuVision's animation functions.

With the program's sketching capabilities, you can create your own visual images! For your text, choose from 10 different type styles, from bold to italic, plain to fancy.

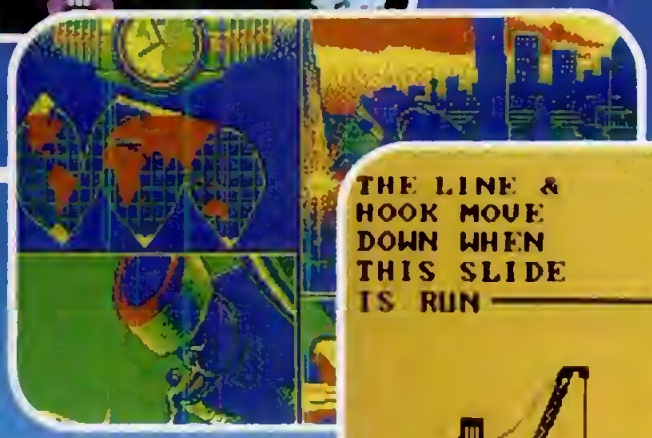
Best of all, you don't have to be an artist to use VCN ExecuVision successfully. Every function is offered in a series of easy to follow menus. VCN ExecuVision also comes with a tutorial disk and an extremely easy-to-follow full-color manual that will take you step by step through the program.

VCN ExecuVision can immediately be put to use making all of your information and ideas—*and you!*—look sharper, more prepared, and more professional.

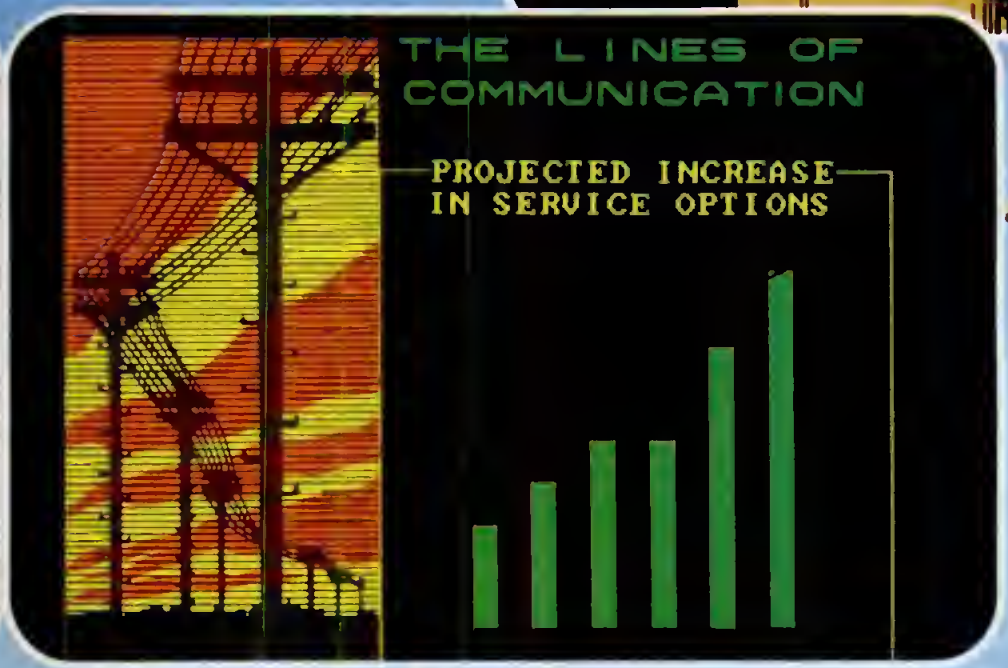
For a demonstration of VCN ExecuVision, visit your nearest computer software dealer. For more information call

MS DOS 2.0/2.1 VERSION NOW AVAILABLE

"...Prentice-Hall's VCN ExecuVision will become the standard against which other programs will be gauged."
—PC Magazine



ABOVE: just two of the library slides from which you can pick images to enhance your presentation data.



Designed for IBM PC and IBM XT

"You don't have to be an artist to create presentation slides like these in minutes!"

Suggested retail price $395. Graphics Libraries individually priced $80-$90.

VCN ExecuVision is a trademark of Visual Communications Network, Inc., Cambridge, MA.
IBM is the registered trademark of International Business Machine Corporation. © 1984 Prentice-Hall, Inc.
Canadian inquiries: write to Prentice-Hall Canada, Inc., 1870 Birchmount Road, Scarborough, Ontario M1P2J7

PC-8/7/84-CII

Mail to:
VCN
ExecuVision
Prentice-Hall, Inc.
200 Old Tappan Road,
Old Tappan, N.J. 07675

I would like to have more information on the exciting potential of VCN ExecuVision sent to the name and address below.

Name _____
Address _____
City _____
State _____
Zip _____

CIRCLE 309 ON READER SERVICE CARD

difference

The HX-12 [illegible] tion and finer dot [illegible] the IBM 5153's medium resolution (.43mm) for a cleaner, sharper image.

Compare our full range of colors and our crisp whites without red bleed. You'll also see a difference in

[illegible] that's a [illegible] eyes and overworked budgets.

Apple IIe users: call us to learn now you, too, can now enjoy the visible superiority of the Princeton HX-12.

PGS Princeton Graphic Systems

1101-1 State Road Princeton New Jersey 08540
609 683-1660 TLX:6857009 PGS Prin.
800-221-1490

DON'T COMPROMISE:

OURS: .31 mm dot pitch, 80 column text.

THEIRS: .43 mm dot pitch, 80 column text.

THE PRINCETON HX-12

HIGH RESOLUTION RGB COLOR MONITOR

for the image your eyes deserve

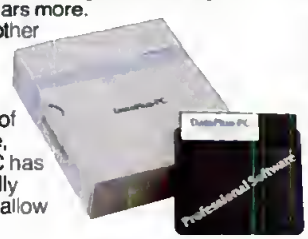
CIRCLE 299 ON READER SERVICE CARD

Let your fingers do the filing...

With DataPlus-PC™

Using DataPlus-PC, all your important last minute information is literally at the tips of your fingers. Incredibly fast and refreshingly easy to learn and use, DataPlus-PC transforms your personal computer into a powerful "electronic filing and report system" which allows you to perform a wide range of sophisticated database functions normally found in programs costing hundreds of dollars more.

Unlike other databases which require hours upon hours of "setup" time, DataPlus-PC has been carefully designed to allow even novice users to begin using it in a matter of minutes. DataPlus-PC incorporates the latest state of the art technology including a completely Menu Driven system which communicates with you in easy to understand English.



The unique **Super Scan**™ function gives you the ability to search for and display any information record in seconds, providing you with almost instantaneous access to your important information. And DataPlus-PC's powerful **MLG**™ (Mailing Label Generator) makes the designing and printing of time consuming mass mailings a breeze. In addition, DataPlus-PC's built-in **Report Generator** provides powerful mathematical capabilities and allows you to produce customized reports just the way you want them, when you want them. And with DataPlus-PC's integrated **Memo Window**™ facility, you'll have a handy "extra text" area which allows you to include remarks, extra notes, client summaries, or other valuable information related to each record.

With DataPlus-PC's ability to easily interact with our best-selling WordPlus-PC™ word processing system, you can select specific information from DataPlus-PC and easily merge it into personalized letters, documents, overdue notices, etc. And DataPlus-PC's user friendly Tutorial Learning Guide assures that even first-time users will be using DataPlus-PC's powerful arsenal of features right from the start.

Don't settle for less than the best. Ask for DataPlus-PC at your local computer dealer or call us today for the dealer nearest you — and "let your fingers do the filing." DataPlus-PC is available from dealers nationwide, with a suggested retail price of $250.

DataPlus-PC, WordPlus-PC, Super Scan, MLG, and Memo Window are trademarks of Professional Software Inc
DataPlus-PC was written and designed by Tom Callen, Universal Software
Prices and specifications are subject to change without notice

Professional Software, Inc.

51 Fremont Street, Needham, MA 02194 Telephone (617) 444-5224 Telex 951579
Now Available for IBM-PC and Compatibles, DEC Rainbow, TI Professional
Dealer, Distributor, OEM Manufacturer and International inquiries are invited

CIRCLE 372 ON READER SERVICE CARD

Quadmodem.™
The intelligent way to talk to other computers.

Ordinary modems can't do what the QuadModem can. Because they're not as smart.

If you expect your computer to communicate effectively with other intelligent systems, you can bet it'll need an intelligent modem. That's where the new QuadModem from Quadram comes in.

QuadModem connects directly to your phone line. From there it can dial a number from memory; detect incoming baud rates; answer the phone when another modem calls; and distinguish between dial tones, busy signals, data transmissions, and human voices (remember those?). It also automatically adjusts for rotary or Touch Tone phone systems and shows you what's happening right on your computer screen.

Even problems aren't problems.

An advanced microprocessor in QuadModem can automatically spot phone problems, and the QuadModem is fully compatible with Bell 103/212A dial up modems and the most popular modem brands.

QuadModem is the complete intelligent modem: with two different versions, an internal model for IBM PC's and most compatibles and a stand-alone for the PC and other popular brands. Both come with full supporting documentation and user manuals. Plus right now, we'll include an introductory offer from The Source.™ And to round it out, you can add QuadTalk, our very powerful, highly intelligent communications software that's menu-driven and very friendly.

If you expect your computer to communicate properly, it's got to act intelligently. It can with the new QuadModem from Quadram.

QUADRAM™
An Intelligent Systems Company

4355 International Blvd./Norcross, Ga. 30093
(404) 923-8668/TWX 810-766-4915 (QUADRAM NCRS)

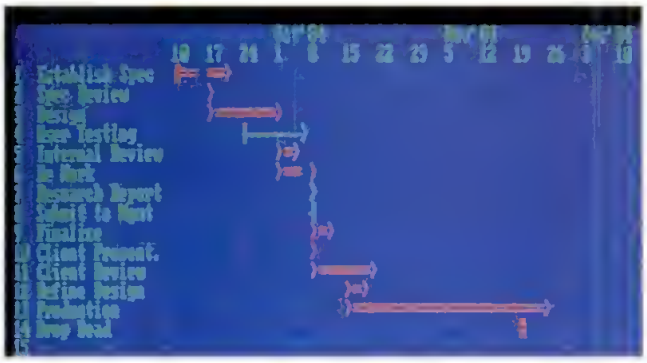
INTERNATIONAL OFFICES
Interquadram Ltd. 442 Bath Road Slough England SL16BB Tel 6286-63865 Tlx 847155 Aurema G Interquadram GmbH Fasanenweg 7 6092 Kelsterbach West Germany Tel 8107-3089 Tlx 417770 Seva G Interquadram s.a.r.l. 41 Rue Ybry 92522 Neuilly Tel 758 1240 Tlx 630842 Isc Sur Chavco Computing 6581 Kitimat Road, Mississauga, Ontario Canada L5N-2X5 Tel 416-821-7800

CIRCLE 251 ON READER SERVICE CARD

IBM® PC, XT, PCjr are registered trademarks of International Business Machines Corporation
*The Source is a registered trademark of Source Telecommunicating Corporation
©Copyright 1984 Quadram Corporation All rights reserved

Now there's no excuse to drop dead.

Producing a brochure. Introducing a new product. Moving your entire company across town. Every project has a start date, a completion date, and a date beyond which you absolutely, positively cannot go. The drop dead date. Blow that date and you've got positively, absolutely no excuses.



Better to arm yourself with Microsoft® Project, the new software tool for business managers and their IBM® PCs. Project tells you which activities are essential to keeping your schedule. And which you can let slide.

Project keeps you on a healthy track.

What a spreadsheet does for financial planning, Microsoft Project does for start-to-completion scheduling. Give it your best to worst "what-if" scenarios. Project tells you what must be accomplished. By whom. By when. At what cost.

When management needs detailed status or budget reports, Project prints them out. In text and bar charts. And it can also send budgeting information to programs like Multiplan,® Microsoft Chart, or Lotus 1-2-3.™

Get Project. No excuses.

Microsoft Project is easy to use. Especially if you're familiar with electronic spreadsheets. It saves your company time, work, money. Makes you an on-time, on-budget manager. Not to mention it's from Microsoft. We're the people who designed the MS™-DOS operating system that tells the IBM PC how to think. And our BASIC is the language spoken by nine out of ten microcomputers worldwide.

MICROSOFT®
The High Performance Software

For the name of your nearest Microsoft dealer, please call 800-426-9400. In Washington State, 206-828-8088.

Should you decide you can face another drop dead date without Project, tell us where to send the flowers.

Microsoft and Multiplan are registered trademarks and MS is a trademark of Microsoft Corporation. IBM is a registered trademark of International Business Machines Corporation. Lotus 1-2-3 is a trademark of Lotus Development Corporation

Chapter 1

(Your picture here)

How *jr* Computerized the Books and I Saved $2,000

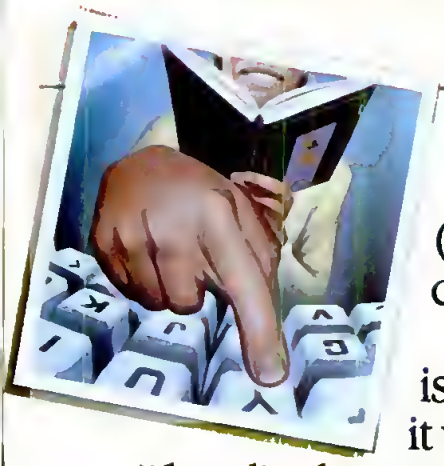
BY _____
(Your name here)

"My Own Rags to Riches Story"

I was an _____ business
(established, industrious, entrepreneurial)
person searching for a way to end the continual drudgery of bookkeeping. Oh, I had looked at computer "solutions." But the software was too _____.
(expensive, complex, intimidating)

Then a salesperson I'd talked to at the local computer store called and said, "Come check out Rags to Riches.™ It was made for you."
I went over and tried it. The price was right. So was the price of the PC*jr** computer it ran on.

And it was so easy to use! No customer or vendor codes or names to type — just pre-assigned keys on the keyboard. It took just five basic commands to use all the modules I needed: _____.
(Ledger, Sales, Payables, Receivables, *All of them*)



Because they're integrated to work together, and all fit on one floppy disk (including my work), I didn't need a second disk drive or an expensive hard disk.

The dealer explained that Rags to Riches is the only package that's "RAM-based," so it works instantly and never makes you wait.

The clincher was the way Rags to Riches is customized to work like my business works. There are even Rags to Riches Solution Booklets™ to help make the most of my investment.

The whole system cost $2,000 less than others I'd seen. Because I hooked it up myself, and learned it so easily, I saved another bundle by not hiring a consultant.

Now it's business as usual, only better. Because my friendly new office machine has computerized my accounting—and more. Rags to Riches has "Open Architecture," meaning the data is compatible with hundreds of other programs. So my business won't outgrow it.

Thanks to Rags to Riches, I actually have extra time to _____. [work on increasing profits, drum up more sales, relax]

And, of course, to let my friends know that success doesn't have to be difficult anymore. (To be continued.)

Chang Labs™
The family of software solutions

For the nearest dealer, call **(800) 972-8800**
In California, (800) 831-8080

Headquarters: 5300 Stevens Creek Boulevard, San Jose, CA 95129 © 1984 Chang Labs
International Distribution: United Kingdom: Vector House, Phone: 01 943 1257 · Belgium: Vector International, Phone 32 (16) 202496 · Japan: Software International, Phone: 03-486 7151
*Also available on PC and compatibles

CIRCLE 123 ON READER SERVICE CARD

With PC TURBO...Speed Wins the Race.

In business, success comes to those who win the race against deadlines and competition. The IBM™ PC is a great tool, but valuable time can be wasted waiting for it to recalculate spreadsheets, retrieve data, or execute the newer and more complex software packages. PCturbo,™ new from Orchid, can help you win and enjoy the fruits of success.

PCturbo is the ultimate IBM PC productivity enhancement. It boosts the execution speed of your PC so you can get more done in less time. And it's transparent to existing programs such as WordStar,™ Lotus 1-2-3,™ and dBase II.™ So, with PCturbo, your PC looks and acts the same as before; it just runs faster.

Who needs PCturbo? Anyone who ever waits for their PC to finish executing so they can run something else. Programmers waiting for compilers to finish before testing a new feature. Businessmen waiting for a data base to retrieve account information. Word processors waiting for the spelling checker to finish before printing.

PCturbo does more than just speed up the PC. It extends the life of slower, older programs. It provides a base for new sophisticated software. And it protects your PC investment. You get your work done quicker and decisions made sooner. The very reasons you got a computer in the first place. Write or call for more information.

ORCHID

ORCHID TECHNOLOGY
47790 Westinghouse Drive
Fremont, CA 94539
(415) 490-8586 Telex: 709289

TECHNICAL DETAILS:

Hardware
- One slot plug-in board with high-speed 16-bit processor (8086 or 80186)
- Up to 640K on-board memory for a maximum of 1.28 Mbytes total PC memory.
- Simple "one step" installation.

Software
- Runs IBM PC-DOS 2.0/1 on either the IBM PC or XT.
- Provides disk caching, RAM disk using available PC memory up to 640 Kbytes.
- Concurrent program execution available soon.

PCturbo is a trademark of Orchid Technology. IBM PC and XT are trademarks of International Business Machines Corporation WordStar is a trademark of MicroPro. Lotus 1-2-3 is a trademark of Lotus Development Corporation. dBase II is a trademark of Ashton-Tate.

CIRCLE 122 ON READER SERVICE CARD

In the Hard Disk Jungle Tallgrass Clears A Path

In today's hard disk jungle, Tallgrass clears a path by offering high performance, integrated mass storage solutions for the IBM® PC/XT, the T.I. Professional and related computers.

TALLGRASS INNOVATIVE FEATURES

MASS STORAGE SYSTEMS with formatted HardFile™ capacities of 6, 12, 20, 35 and 70 Mb, all with built-in tape backup.

CONVENIENT INTEGRAL TAPE BACKUP SYSTEM allows rapid tape "image" streaming, or incremental file-by-file backup and restore on ANSI standard inexpensive data cartridges, instead of the usual floppies, video cassettes, or low-capacity removable Winchester devices.

NETWORK READY and fully compatible with networks such as PCnet® and EtherShare.™

HIGH RELIABILITY with dual directory and read-after-write verify options. A dedicated landing zone, where the read/write heads reside when the disk is idle, provides data protection during powerdowns and transportation.

Follow the Tallgrass path to your local computer dealer and watch your personal computer transform into a powerful data processing system.

Available from COMPUTERLAND,® Entré® Computer Centers, MicroAge® Computer Stores and other participating computer dealers.

New!
IBM-XT Cartridge Tape Backup

World Headquarters: Tallgrass Technologies Corp. / 11100 W. 82nd St. Overland Park, KS 66214 / 913/492-6002 / Telex: 215406 TBYT UR

Canadian Headquarters: Tallgrass Technologies (Canada), 1775 Meyerside Drive, Mississauga, Ontario, Canada L4V 1H2 / 416/673-3244

European Distributor: CPS Computer Group, LTD Birmingham, England B276BH / (021) 7073866

Australian Headquarters: Tallgrass Technologies (Australia) / Five Dock Plaza, Suite 12/50 Great North Road / Five Dock / Sydney, N.S.W. 2046 / (02) 712-2010

CIRCLE 445 ON READER SERVICE CARD

Tallgrass Technologies Corporation

IBM® is a registered trademark of International Business Machines Corp PCnet® is a trademark of Orchid Technology EtherShare™ is a registered trademark of 3Com Corp

People are going for Friday!™ like there's no tomorrow.

Friday! is the new electronic file handling system that has become an instant best-seller because it's so revolutionary.

Within two weeks, it broke into the Top 20 on the sales chart of Softsel, one of the country's leading computer software distributors.

And it's now well on its way to the top.

The Friday! phenomenon is simple.

Friday! uses simple menus and talks to you in plain English, so almost anybody can use it.

It's great for sales and commissions, clients and portfolios, mailing lists and labels, invoices, inventories, paychecks, reports and more. And it works with other microcomputer software like 1-2-3™ and dBASE II® (our own advanced database management system).

It comes with a complete, step-by-step tutorial, but you can set up an "electronic file" without even looking at the manual, then use it at the touch of a few keys.

Friday! finds any filed information in seconds. Computes totals, subtotals, commissions, etc. Prints form letters and mailing labels. Gives you quick reports from all or part of a file with a few keystrokes. Or if you need a special report for your bank or board of directors, just "paint" the format on your screen, then have Friday! do all the work.

And while Friday! does more than file handling systems selling for as much as $495, it's yours for just $295 (suggested retail price)!

For more information, contact Ashton-Tate, 10150 West Jefferson Boulevard, Culver City, CA 90230. (800) 437-4329 ext. 204. In Colorado, (303) 799-4900. In the U.K., call (0908) 568866.

Or for the name of your nearest dealer, just call 1-800-4-FRIDAY, ext. 204.

ASHTON·TATE

*Ashton-Tate 1983. Friday! is a trademark and dBASE II is a registered trademark of Ashton-Tate. 1-2-3 is a trademark of Lotus Development Corp.

CIRCLE 116 ON READER SERVICE CARD

We thought about calling it MacSimplex . . . after all it makes your IBM®PC behave like a Macintosh™ and much more . . .

and with over two years in the making, the Simplex Database Management System has features like 32-megabyte virtual memory and the most powerful networked/relational database in the microcomputer industry. Simplex was designed around how you think and the Macintosh way, so that you can use your favorite mouse to handle those mundane tasks like menu selection and data manipulation. And, if you don't have a mouse, you can use our keyboard mouse simulator, MouSim™.

Pop-up and pull-down menus, dialog and alert boxes are not just added features, they are the heart of the Simplex way. In addition, Simplex gives you both a software and a hardware floating point capability, each with 19-digit accuracy. It permits login, password, privilege, and can be used on a local area network. Simplex has full communications and a remote or local printer spooler. Above all, Simplex is modular and grows with you! Simplex also has a full-featured, English-like language which is simple to use.

You can't buy Simplex™, but it is now available as an integral part of *it's my* ***Business***™ and will be used by *it's my* ***Word***™, *it's my* ***Graphics***™, . . .

Businessmen! *it's my* ***Business*** will revolutionize the way that you handle your business. It saves time, money, and standardizes your system for all who use it. *it's my* ***Business*** comes with applications like accounting, interoffice or intraoffice mail, editing, invoicing, inventory managment, mail list, calendar, scheduler, forms and more. You can modify each of these to create applications specifically designed for you... maybe we should have called it "it's your Business".

Professionals! *it's my* ***Business*** has over 200 pages of examples and demonstrations to show you how to solve your everyday professional problems. And if these examples aren't enough, we give you a complimentary one-year subscription to Questalk™, our hands-on Simplex applications magazine.

System integrators and consultants, beware! If you are not using *it's my* ***Business*** with Simplex to solve your problems, don't be surprised when more novice programmers solve that complex math, industrial engineering, or business problem faster. We think that you can cut your concept-to-development time by an order of magnitude!

it's my ***Business*** (includes *it's my* ***Editor***) - $695.00
it's my ***Business*** Demo Disk - $20.00
it's my ***Editor*** - $100.00.

Quest Research software is available through your local computer store or through mail order from Quest Software Corporation at (205) 539-8088. 303 Williams Avenue. Huntsville, AL 35801.

Value added resellers and dealers please contact Quest Research, Incorporated at (800) 558-8088. 303 Williams Avenue, Huntsville, AL. 35801.

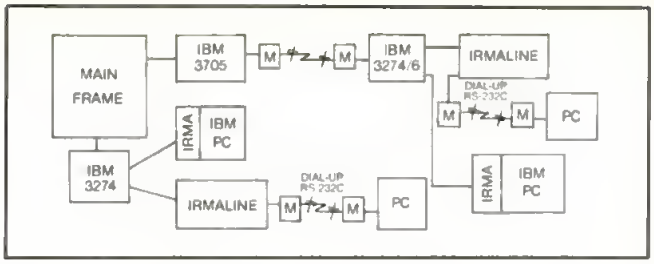
QUEST™

Quest Research Inc.

IBM is a registered trademark of International Business Machines. Macintosh is a trademark of Apple Corporation. *it's my* ***Business***, *it's my* ***Word***, *it's my* ***Graphics***, *it's my* ***Editor***, *it's my* ***Home***, *it's my* ***Voice***, *it's my* ***Ear***, *it's my* ***Statistics***, Simplex, MouSim, Questalk, and the Quest logo are trademarks of Quest Research, Incorporated.

CIRCLE 493 ON READER SERVICE CARD

Here are two beautiful ways to get small computers on line with the mainframe quickly, easily and economically—yours from DCA, home of the industry's first coaxial cable links between small computers and IBM 3270 networks.



IRMA™ is the Decision Support Interface™ that gets IBM Personal Computers and IBM PC XTs into the 3270 mainstream via direct attachment to 3274 or 3276 controllers.

IRMA, IRMALINE, and Decision Support Interface are trademarks of Digital Communications Associates, Inc

IRMA® and IRMALINE®. The DCA family connections that help small computers think big.

© 1983, Digital Communications Associates, Inc.

IRMALINE™ does the same for remote IBM PCs, IBM PC XTs, Apple Lisas and DEC Rainbows, among others, with just a local phone call to a nearby 3270 controller.

Both can go to work literally minutes out of the box. Both provide mainframe data access, selection and storage, and data communication back to the mainframe.

Put first things first. Find out more about the DCA first family of 3270 micro/mainframe connections. For information, write DCA, 303 Technology Park, Norcross, Georgia 30092. Phone (404) 448-1400, TLX 261375 DCA ATL. Or call us toll-free (800) 241-IRMA.

dca®
Digital Communications Associates Inc

CIRCLE 444 ON READER SERVICE CARD

IBM PC and IBM PC XT are trademarks of International Business Machines Corporation. Apple and Lisa are trademarks of Apple Computer, Inc. Rainbow is a trademark of Digital Equipment Corporation.

How to make your IBM run 2½ to 4 times faster.

Just plug in the Accelerator PC™ and watch your IBM* PC or XT take off.

Yes, Titan's done it again. The innovators who speeded up the Apple® now bring similar performance advantages to IBM users. Imagine running Lotus® 1-2-3™, VisiCalc®, or Multiplan™ without long delays. With the Titan Accelerator PC, your IBM PC or XT can run all your software faster. Data bases, word processors, spreadsheets, graphics, and much more will speed up by a factor of 2½ to 4 (average around 3).

The Accelerator PC has a 10 MHz 8086 processor and 128K of high-speed RAM, expandable to 640K with the memory upgrade piggyback option. It's compatible with your present hardware and software, and designed to be ready for future enhancements.

Get your work done in a third of the usual time.
See your computer dealer today or contact: Titan Technologies, Inc., P.O. Box 8050, Ann Arbor, MI 48107; Telephone (313) 662-8542.

Titan
TECHNOLOGIES, INC.

Sales and Marketing by The MARKETING RESOURCE GROUP, Fountain Valley, CA.

IBM is a registered trademark of International Business Machines Corporation. Lotus and 1-2-3 are trademarks of Lotus Development Corporation. Multiplan is a trademark of Microsoft Corporation. Apple is a registered trademark of Apple Computer Inc. VisiCalc is a registered trademark of VisiCorp, Inc. Accelerator PC is a trademark of Titan Technologies, Inc.

CIRCLE 802 ON READER SERVICE CARD

IBM Personal Computer Trends and Developments

IH News

FROM THE EDITORS OF PC

AUGUST 7, 1984

Compaq Is Desktop Hit

Nifty touches—faster speed, tiny tape back-up, ultra-compatibility and comparable price—make latest Compaq what the PC should have been

BY BILL MACHRONE

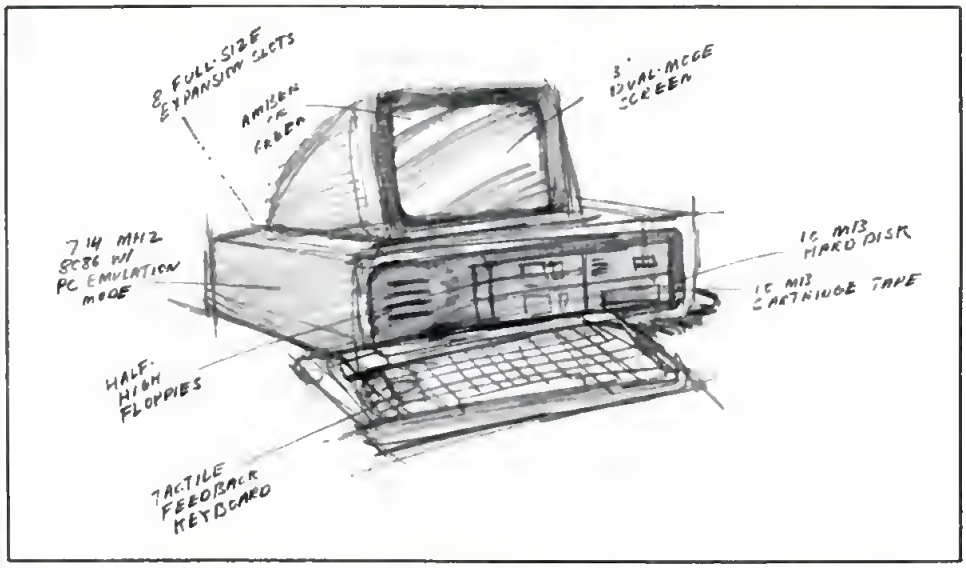
NEW YORK—Peter Norton said it best: "Compaq's new machine is what the PC-XT should have been."

The Deskpro, code-named "Bullet" during development, is a radical departure from Compaq's existing product line. First, it lits on a desktop; it isn't a portable. Second, it goes well beyond mere compatibility into new reaches of performance and functionality. On the outside, it's virtually indistinguishable from a PC-XT. On the inside, it's a whole new ball game.

The processor is an 8086 and it runs at 7.1 MHz, good for performance two to three times faster than the PC's. It has a slow-down mode that equals the PC both in clock speed and bus timing, so that clock cycle-dependent programs for the PC can run unaltered. In a wry touch, the LED pilot light on the front of the machine turns from its normal green to red when it enters the slow mode. There are eight expansion slots, and an 8087 socket. Deskpro is also available with a 10-megabyte hard disk and tape backup.

The 10-megabyte cartridge tape drive is an innovation not seen before on a personal computer. It uses the 3M mini-data cartridge format, much smaller than the standard data cartridge, and more reliable than digital cassette-based backup systems.

(continued)



IBM Fires First Volley—A Biggie—In Price Wars

Compatible manufacturers scramble to match prices, and stay alive

BY DON KENNEDY

NEW YORK—For many in the microcomputer business, there was no "happy hour" on Thursday, June 7. At 5:30 p.m. that day, IBM made a dramatic move that gave consumers the best deals ever available on its family of personal computers. The price cuts signalled the beginning of intensified competition that many analysts feel spells real trouble for some of the companies now producing PC-compatible machines.

IBM made sweeping, deep cuts—18 to 23 percent—on the prices of each of the computers

(continued)

Price Wars *(continued)*

in its "PC family," the PC, XT, Portable, PC*jr*, XT/370 and 3270-PC. By also increasing the minimum memory of the PC from 64K to 256K bytes, the industry leader established new, lower pricing standards that makers of "work-alike" models could ignore only at great peril to their future.

The cuts came after heavy pressures on IBM stock on Wall Street. Throughout the week, the stock had traded at or near its low for the year, and rumors were rampant that price cuts were imminent due to sluggish retail sales of the whole PC line.

Although analysts estimate that revenues from the personal computer line constitute less than 10 percent of IBM's overall business, the perception of weak 1984 PC-family sales created a case of "the tail wagging the dog," as one industry insider put it. This, it was felt, explained the unusual timing of the announcement, which came after Wall Street and most East Coast offices had already closed.

Saying it was introducing "more cost-effective versions" of its hardware, IBM set the price for the new entry-level PC with 256K and one disk drive at $1,995. A typically configured PC with disk drive and adapter and monochrome monitor and adapter would now list at $2,420, a 23 percent reduction.

The XT with 256K, monochrome display and adapter was slashed from $6,005 to $4,920. The Portable was cut $200 to $2,595, and the enhanced PC*jr* with 128K and disk drive was cut from $1,269 to $999, with the 64K PC*jr* reduced from $669 to $599. There were similar reductions on most of the hardware options available for the PC family, as well.

Industry watcher Esther Dyson, president of EDventure Holdings, Inc., is one analyst who thinks the price cuts were "the wrong response to the sluggish market conditions."

Shake-up Strategy

"Clearly, IBM Corporate is unhappy with Boca's performance," she said, referring to the main site of the Entry Systems Division. "'Don't just stand there,' they [corporate headquarters] said, 'Do something!' So Boca did something, and, clearly, it's easier to cut prices than come out quickly with a new product."

Dyson feels, however, that in the final analysis, the problems that caused sales to be less than anticipated had little to do with prices and more to do with a generally sluggish demand for the PC, XT, and Portable combined with a poor perception of the PC*jr*. The price cuts, she said, are "not going to help IBM all that much—by cutting into their margins."

(IBM's mainframe Information Systems Group followed Boca's suit by making similar cuts on its PC versions.)

Other analysts pointed to the cost benefits of increased production and estimated little negative effect on IBM from the cuts. However, most were ready to predict negative, perhaps even traumatic, effects on competitors producing PC "work-alikes."

Battles Begin

"It's the first salvo in the bloodbath, which we believe is coming, but it's far from the last," said Douglas A. Cayne, analyst at the Gartner Group, a Stamford, Connecticut, research firm. It was his belief that IBM's competitors in the PC-compatible field would have to match or beat the new prices. He also believed that some of them lacked the margins to do it and still realize enough of a profit to remain financially healthy.

His predictions looked accurate in the days following the price cut announcement. Within 24 hours, Eagle Computer, Inc., Corona Data Systems, Inc., and Leading Edge Products, Inc., had announced their own price cuts on PC-compatibles.

In the following weeks, retailers responded with their own cuts. Sears Business Centers, for example, knocked an additional $300 off the PC, XT, and Portable. "IBM has put the gleam back in the salesperson's eye," reported one happy customer in California.

George McMurtry, vice president of sales for Corona, explained that Corona had anticipated the IBM price cuts. The cuts are "nothing out of the ordinary," he said, adding that Corona had sent its distributors a new price schedule about 3 weeks earlier. These reductions had been slated to take effect on July 16, but the Thousand Oaks, California firm was considering advancing that date in light of IBM's move.

Bill Sellers, vice president of market research and one of the founders of Leading Edge, said that the Needham, Massachusetts firm had been positioned to drop its prices, anyway, and had in fact changed their prices 10 days before IBM's announcement. He said the announcement of the lower prices for the Leading Edge PC had been delayed to allow the company time to prepare other announcements about new products, and its timing the day after IBM's announcement was coincidental. Leading Edge also cut its stripped word processing software to $100.

"We're following along on our own marketing plans," he said, and added that he anticipates few problems because his company's PC-compatibles are made by Mitsubishi, "which is even bigger than IBM." He did add, "Some American firms may be in trouble, though," and said that all IBM competitors would have to meet or undercut the new prices or risk losing sales.

Eagle Responds

Eagle Computer also dropped its prices 10 to 15 percent below the IBM price, and Ronald Mickwee, president of the Los Gatos, California, firm was reported as saying his company would survive because, as a smaller company, it can respond faster to the market than could a

IBM's New Prices

NEW 256K MODELS	
PC 256K/360K Disk	$1,995
PC 256K/2-360K Disk Drives	2,420
Portable PC 256K/2-360K Drives	3,020
PC/XT 256K	4,395

SYSTEM UNITS WITH KEYBOARD	NEW	OLD
PC 64K	$1,265	$1,355
PC 64K/360K Disk	1,815	2,104
Portable PC 256K/360K Disk	2,595	2,795
PC/XT 128K	4,275	4,995
PC*jr* 64K	599	669
PC*jr* 128K/360K Disk	999	1,269

OPTIONS		
64K Memory Module	$ 100	$ 165
64/256 Memory Expansion Card	265	350
Game Control Adapter	45	55
Prototype Card	35	45
Communications Adapter Cable	65	75
Asynchronous Communications Adapter	100	120
Binary Synchronous Comm. Adapter	240	300
SDLC Communications Adapter	240	300
Diskette Drive Adapter	125	220
360K Diskette Drive	425	529
Monochrome Display and Printer Adapter	250	335
Printer Adapter	75	150
Fixed Disk Drive Adapter	590	695
PC Expansion Unit	2,880	3,390
PC/XT Expansion Unit	2,290	2,695
10MB Fixed Disk	1,395	1,695
8087 Math Co-Processor	230	260
Printer Stand	45	55
Printer Cable	45	55
Graphics Printer	449	595
Monochrome Display	275	345

corporate giant like IBM.

Nonetheless, there's little dispute that IBM's price cuts are going to put the squeeze on most competitors in a major way. Sellers predicted that companies like Compaq and Columbia will face particularly difficult times in the months ahead.

In the immediate wake of IBM's moves, however, Compaq, which has soared on the tails of IBM, held tight. "There's absolutely no change on the price of the Compaq," said Ken Price, director of communications. The typical 256K Compaq is about $2,495.

Compaq believes IBM's new prices mean the computer giant is willing to come to the price point where everyone else is. And, the market is no longer willing to pay a premium for IBM's product, added Price.

Dyson anticipates the keenest struggle for survival will involve those companies that have based their strategies on pricing as a desirable alternative to IBM hardware. She says it will be a tough summer for "people like an Eagle and people competing on price. Even for someone like a TI."

Cayne's predicted "blood bath" looms on the horizon, and Dyson indicated the weapons that will be used. "If you play with price," she said, "they're going to come at you with price."

Larger Systems

Cuts on the PCs that are connected to larger systems are complicated because of the various models involved. The XT/370 Model 568 dropped to $6,230 from $6,720 and the Model 588 with the 10-megabyte hard disk to $8,085 from $8,995. (The price for the XT-to-XT/370 upgrade kit remained at $3,790.)

For the 3270-PC Model 2 (256K, display, disk, and keyboard adapter) the price went to $3,785 from $4,290. The Model 4 with 384K and printer adapter is now $4,650 versus $5,319 before, and the Model 6 with the fixed disk and printer adapter is now $6,210 versus the earlier $7,180. (Both Models 4 and 6 now come with 384K standard—instead of 320K.) ■

Eagle Computer Toughs Out Creditors, Price Cuts

LOS GATOS, Calif.—Eagle Computer Inc. took two hard punches but stayed on its feet in its latest round in the PC-compatible ring. Whether Eagle goes the distance now depends more on the fans—the users and dealers—than on whether the company can placate creditors calling in $10.8 million in unsecured loans.

Eagle executives were meeting with creditors the day IBM sliced 18 to 23 percent off its PC prices (it was the computer's low price that initially sent Eagle soaring in the last 2 years of PC-compatible competition.)

Eagle managed to calm the creditors and matched IBM's price cuts.

However, dealers the next week said they were hesitant to recommend the Eagle system because of the implications of the company's troubles. Genre Group, the chain of former XEROX computer stores, confirmed it was discontinuing the Eagle line.

Eagle took a heavy punch when it lost almost $10 million in the third quarter (ending March 31) this year because it could not deliver systems with BIOS (Basic Input/Output System) code acceptable to IBM. IBM Corp. lawyers demanded that Eagle's BIOS not infringe on IBM's copyrighted one, and Eagle agreed not to ship any product with the contested design.

It was well into April when Eagle resumed shipping product, including its new Turbo XL, an XT alternative that runs the Intel 8086 at either 4.77MHz (the speed of IBM's 8088) or 8MHz. ■

Compaq *(continued)*

The drive, co-designed by Compaq and Irwin Magnetics, is manufactured by Irwin. It records eight data tracks plus a servo track. The servo track allows the head to adjust itself during playback to virtually eliminate misalignment. The drive uses the floppy disk controller to read and write to the tape, saving in parts and cost.

Flexible Models

Deskpro is configured as four basic models, in which the major variants are amount of memory and number and type of mass storage. Model 1 comes with 128K and a half-high floppy disk. Model 2 has 256K and two diskettes, while Model 3 has 256K, a single floppy, a serial port and clock, and a 10-megabyte fixed disk. Model 4 rounds out the line with a full 640K, a floppy, 10-megabyte hard disk, the serial port and clock, and a cartridge tape drive. The Model 1 lists for $2,495, while the Model 4's retail is $7,195. Compaq knows that its prices are a few hundred dollars above equivalent IBM machines, but expects to compete successfully based on its products' quality, available features, and performance.

There are other features that make this entry more attractive to the business market. Compaq's famous dual-mode screen will be available in either green or amber and it will drive an optional RGB monitor. The keyboard, while adhering to the IBM layout (Compaq executives feel that they are forced to use this standard by all the IBM-oriented documentation), will have a tactile feel somewhat like that of the highly regarded keyboard for the Texas Instruments Professional.

Quintessential Compatible

Engineering director Gary Stimac claims that they have tested a great many boards, including 3Com's Ethernet, on the new machine and have, by and large, found everything to be compatible. Similarly, they have tested virtually every commercially significant software package and met with similar success. The software publishers worked with Compaq under nondisclosure agreements, but when asked about the performance of their products on the Bullet, their grins told it all. "I'm really not supposed to say anything," said one software company president, "but it's the answer to our dreams."

Product marketing manager Mike Swavely hinted that the Houston-based company, the most successful start-up company ever, has big plans for the Deskpro. "We are counting on it to be the base of a number of future entries and products," he said. President Rod Canion was more direct: "We intend to be one of the five major microcomputer manufacturers. The market can't support much more than that, and we intend to be firmly in that number."

Canion also discounted the rumors about a Compaq lap portable. "We looked at the designs and tried some engineering prototypes. But the market isn't screaming for LCD displays and there just isn't a viable low-power technology available yet. I doubt that you'll see a real, workable lap compatible until sometime after the first quarter of 1985."

The Desktop was available in limited numbers through dealers the week following its June 28 announcement in New York.

TI Roots

In some ways, the Deskpro is less the machine that IBM should have designed than the machine Texas Instruments should have built. There's still a long shadow extending from Dallas to Houston as the key players at Compaq work to cast off their TI heritage. Many of the policies and operating environments at Compaq exist solely because they are the antithesis of the way things were done at TI.

But Compaq's principals are beholden to no one but themselves for the clear advances that the Deskpro brings to personal computing. They made a point of asking their dealers, "What do you want from us?" The answers they got, desktop and higher-end machines, frankly surprised them. But they geared up, did some fast engineering, and planted a Bullet dead center into the business market. ■

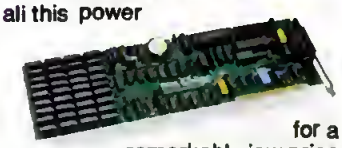
Mr. Chips™ Plays Your PC Like a One Man Band

Mr. Chips, the new multi-function card from Orange Micro, adds a full ensemble of features to your IBM® PC. Memory, printer ports, and a clock are standard, and you'd expect them on a top quality board. But computing is changing.

Soon computers will take care of everyday things; like watering the lawn, or turning on your lights when it gets dark. And only Mr. Chips can do this now. These capabilities are standard, so your growing needs won't require additional equipment. There's also a dual game port, so you can duel to the end, by yourself or with a friend.

Every Mr. Chips comes with Chipdisk™ software, for RAM disk and print spooling. With RAM disk you set up your PC's memory to act like a disk drive. This means much faster execution and searching of programs. Print spooling sets your PC's RAM to serve as a printer buffer, so you can compute even while your printer is printing.

You can orchestrate all this power



for a remarkably low price. Visit your dealer and see for yourself: Mr. Chips is the multi-function card for today...and tomorrow.

The First Multi-function Card with 9 Standard Features

- **Parallel Port*:** Great for getting fast printouts on efficient dot matrix printers.
- **Serial Port:** The most popular way to access high grade letter quality printers or phone modem communications.
- **64K–256K RAM:** Upgrade your PC's memory to handle powerful integrated software and other larger programs.
- **Clock/Calendar:** Accurately keep track of time and date, even when your computer is turned off.
- **Dual Game Port*:** Accommodate two complete joysticks at once, so you can play alone or duel with a friend. Also for use with CAD/CAM software.
- **Real World Interface:** This innovative port can monitor and control equipment like thermostats, moisture detectors, photocells and other independent devices.
- **BSR™ AC Line Controller*:** Control your lights, appliances, security systems, or anything that plugs into an AC wall socket.
- **Chipdisk RAM Disk:** Set your PC memory to act like a disk drive. Your programs will run much faster than with conventional disk drives.
- **Chipdisk Print Spooler:** Your PC memory will serve as a printer buffer, so you won't have to wait for your printer anymore.

*Cables available separately

■ BSR is a registered trademark of the BSR Corporation
■ IBM is a registered trademark of International Business Machines Corporation

Orange Micro Inc.

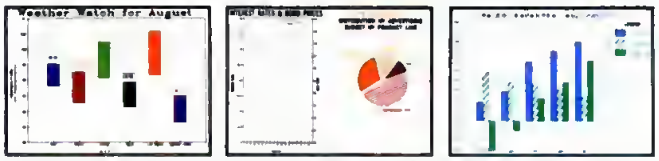
1400 N. LAKEVIEW AVE., ANAHEIM, CA 92807 USA
(714) 779-2772 TELEX: 183511CSMA

© Orange Micro, Inc., 1984

CIRCLE 285 ON READER SERVICE CARD

Chart-Master™ turns volumes of complex data into easy-to-understand graphics.

"A picture is worth a thousand words." With this simple concept as a building block, Chart-Master is changing the way busy executives, analysts and secretaries look at, interpret and present information. In a fraction of the time required to wade through volumes of printouts, you can



Values printed at data points; both left and right Y-axis scales; floating legends & bars; both horizontal & vertical formats; exploded pie sections.

produce easy-to-understand bar charts, pie charts and scatter diagrams quickly and dramatically. Chart-Master makes it easy to customize reports and presentations with six different fonts, label placement, proportional pie charts and more.

Menu-driven Chart-Master allows you to enter data and select a chart format at the press of a button. You then preview your selection on your personal computer screen as it would appear in final form. Or, you can review the various Chart-Master graphic options to make sure you have selected the most effective format. When satisfied, you can transfer your selection to paper or acetate transparencies for a colorful, presentation-quality chart in seconds.

Chart-Master presents a *clear picture* of the "bottom line," which conveyors of information understand and decision makers appreciate. That's why major corporations like GE, Eastman Kodak, Exxon, Union Carbide, GM, AT&T, DuPont, 3M, Citibank, Motorola, Procter & Gamble, and GTE rely on Chart-Master to translate "volumes of complex data into meaningful information."

Chart-Master supports the IBM Instruments XY750, Panasonic VP Series, Houston Instruments DMP29, Yokogawa PL1000 and Strobe plotters, in addition to the Hewlett-Packard family of plotters, for use with IBM PC and other compatible computers.

The retail price of Chart-Master is $375. For a complete information kit and name of your nearest dealer, contact Decision Resources, Inc., 25 Sylvan Road S., Westport, CT 06880. (203) 222-1974.

DecisionResources

Software Designed for Decision Makers

CIRCLE 221 ON READER SERVICE CARD

Why people choose an IBM PC in the first place is why people want IBM service...in the first place.

After all, who knows your IBM Personal Computer better than IBM?

That's why we offer an IBM maintenance agreement for every member of the Personal Computer family. It's just another example of blue chip service from IBM.

An IBM maintenance agreement for your PC components comes with the choice of service plan that's best for you—at the price that's best for you.

Many customers enjoy the convenience and low cost of our carry-in service. That's where we exchange a PC display, for example, at any of our Service/Exchange Centers.

And for those customers who prefer it, we offer IBM on-site service, where a service representative comes when you call.

No matter which you choose for your PC, an IBM maintenance agreement offers you fast, effective service.

Quality. Speed. Commitment. That's why an IBM maintenance agreement means blue chip service. To find out more about the specific service offerings available for your PC, call 1 800 IBM-2468, Ext. 141 and ask for PC Maintenance.

Blue chip service from IBM

CIRCLE 164 ON READER SERVICE CARD

VisiCorp Repositions Its Products and Approach

With more tightly packed Visi On code, battered VisiCorp expands its line to fit floppy disks

BY JAMES LANGDELL

LOS GATOS, Calif.—After several months of sailing on turbulent waters, VisiCorp repositioned its cargo of software to help the company stay the course in today's PC market.

The latest maneuvers in VisiCorp's product line are possible because its programmers refined the software used in its Visi On environment. The new streamlined code (written in C), which VisiCorp claims is nearly 40 percent smaller than before, is used in an upgrade—called Performance Visi On—that will run faster on hard disk systems, as well as a new line, Floppy-Based Visi On, that fits Visi On, for the first time, onto a PC without a hard disk.

The Visi On mouse will also be enhanced by software, developed by Mouse Systems, that makes the mouse be a tool for creating *Macpaint*-style graphics, with color as well.

VisiCorp claims that its Visi On series, introduced at the end of last year, is still the only product line combining windowing and data transfer environment with applications programs tailored for that environment.

VisiCorp's chairman, Dan Flystra, admits that being the first is a mixed blessing. Now that its product has been used by customers for 6 months, VisiCorp used their comments and complaints to improve Visi On's performance. At the same time, Flystra told *PC Magazine*, users' and reviewers' criticisms have cast Visi On in the harsh light of reality, compared to the promotional glow surrounding products that are said to be equivalent, but have yet to be marketed.

Another disadvantage encountered by pioneers, Flystra said, is that the terrain you reach isn't always what you expected. VisiCorp's original target for Visi On was to create a software environment that gave the less expensive (and less powerful) IBM PC system the same integrated features built into Apple's Lisa and the Xerox Star.

After months of development, Visi On met that target... but the target had moved. Users were initially excited by Lisa's integrated mouse and window features, but few bought the system because of its low speed and $10,000 price. When Visi On was ready for customers, it was about as fast as the too-slow-for-comfort Lisa and cheaper. However, that wasn't enough to bring VisiCorp success where Apple had already failed.

Lisa, however, became a winner the second time around, when a faster, improved Lisa 2 shared the spotlight a year later with Apple's Macintosh. Now VisiCorp is giving Visi On a second chance, learning from experience to give users what they want.

Waiting for Hardware

While Visi On's speed disappointed many IBM PC users, the software was better received by users of faster machines, such as the Wang PC. VisiCorp's new Performance Visi On (also called Visi On 1.2) will be fast enough, Flystra claims, to allow an IBM PC to match the present performance of Visi On on the Wang PC—and the Wang's speed will increase that much more. IBM PC users may find that Performance Visi On now passes the "foot-shuffling test," in which they ask, "does the program keep me waiting, shuffling my feet, more than I can stand?"

Another setback that Visi On will attempt to overcome involves hardware. VisiCorp anticipated that, by the time Visi On was available, most IBM PCs would have hard disks, generous amounts of RAM, and mice as standard equipment. Although IBM had introduced its hard disk XT and many breeds of mice were available by the time Visi On appeared, few users had mice and hard disks were still beyond the budget of most users.

VisiCorp found that many users who considered using Visi On balked at paying another $2,500 or more to add a hard disk and mouse to their computers.

To reach more users, VisiCorp is introducing a new product, Floppy-Based Visi On, which can be used without a hard disk on a system with two disk drives and a mouse. The Floppy-Based Visi On Applications Manager software will be different from that sold for use on a full hard disk system, but the Visi On applications themselves (*Visi On Calc*, *Visi On Graph*, and *Visi On Word*, so far) are identical. The main difference in capabilities is that only one application can be loaded at a time, so disks have to be moved in and out of drives to switch between applications or perform data transfers.

Floppy Versions

VisiCorp has not announced the prices for its Floppy-Based Visi On products, which were demonstrated at this summer's National Computer Conference in Las Vegas, but the company plans to have this new product line address mainstream business users of PCs. For the other ends of the market, its Visi-Series software is now priced within reach of home and small-business users with hardware worth about $1,500, while the full Visi On is targeted at high-end business users with hard disk systems, representing at least $5,000 of hardware.

Users who balked at buying a mouse just to run Visi On (about the only package for the PC that absolutely requires a mouse) will find the new Visi On Mouse makes a better case for being useful in its own right, thanks to a bundle of Mouse Systems' software. The mouse will include a *Paint* program, which adds color to Macintosh-like graphics powers, and a set of "Pop-Down Menus" that put the mouse to work with a number of specific products, such as *WordStar*, *1-2-3*, and *Multiplan*, in addition to *VisiCalc* and *VisiWord*.

Software developers also can gain from Visi On's new "less is greater" trend. A new Resident Toolkit, which can be used to develop Visi On applications programs, can run on a 512K IBM XT under PC-DOS. This puts Visi On development in reach of more programmers, who previously needed a 68000-based UNIX system that would cost at least $12,000, and keep the developers in touch with the same hardware environment faced by users. ■

Speaking of Computers: 'Do I Hear A Waltz?'

"Using *WordStar*, the all-time best-selling word processing program from MicroPro International, is like waltzing with a refrigerator; it can be done, but it's a lot of hard work."

N.Y.P.C. Newsletter, *The New York IBM Personal Computer Users' Group, April 1984*

Calling Micro Mart™ Can Be Music To Your Ears

Micro Mart is more than mail order. We are a multi-million dollar production, orchestrating your favorite PC hardware and software at superb discounts—all accompanied by great service and technical support.

Find out what our biggest critics (our Fortune 500 accounts) already know. Our selection is above measure. Each of our consultants are virtuosos in personal productivity and our discount savings will tickle your ivories.

We're playing your tune in the heart of distribution, not just fiddling about "the Old Mill Stream." So check out the score of state-of-the-art PC products in the rear of this magazine and give us a ring. Ask for expert advice and your best price.

Also Appearing Daily In:
Atlanta • Charlotte
Washington DC • Tampa
Louisville • Showrooms
Coming Soon To:
Ft. Lauderdale • Orlando
New Orleans
Micro Mart Computer Centers
See our 2-Page Ad in Rear of Magazine

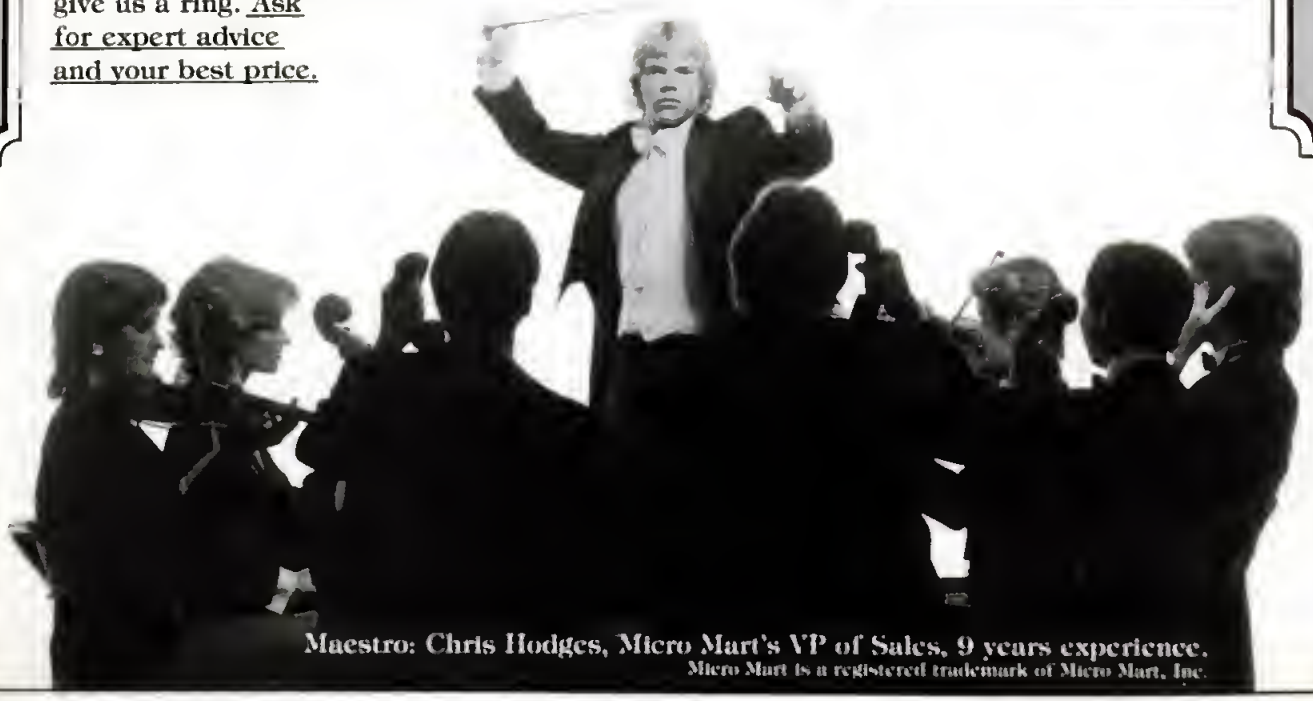
America's PC Specialists

MICRO MART™

Technology Corporate Campus
3159 Campus Drive•Norcross, GA 30071

Orders Only 1-800-241-8149
For Information 1-404-449-8089

Show Our Ads To Your Purchasing Agent



Maestro: Chris Hodges, Micro Mart's VP of Sales, 9 years experience.

Micro Mart is a registered trademark of Micro Mart, Inc.

CIRCLE 478 ON READER SERVICE CARD

Ashton-Tate, Informatics Link PCs to Mainframes

dBASE/Answer links to mainframes without giving DP director heart attack

BY BILL MACHRONE

NEW YORK—If you can't beat 'em, join 'em. And if you *can* beat them, well, join them anyway.

That was the prevailing spirit in the joint announcement by Ashton-Tate and Informatics General. The product, *dBASE/Answer*, is an innovative link between mainframes and PCs.

Ashton-Tate's *dBASE II* has given a whole generation of data processing managers fits as users took matters into their own hands. Informatics' *Answer/DB*, meanwhile, has gained wide acceptance in the mainframe community as a flexible and facile report generation and database access tool. *dBASE/Answer* brings the two worlds together.

At the PC, the user creates a query or set of search criteria, prompted by help screens and an interactive query-generating facility that includes a data dictionary. *dBASE/Answer* then transmits the query to the mainframe, where it is executed. The host machine then transmits the subset of the file and fields that met the search criteria back to the PC. The receiving software builds a *dBASE II* or *dBASE III* file from the data as it comes over the line.

Mutual Effort

While the companies have agreed to "co-publish" the product, it is primarily an Informatics effort, composed of two parts: a mainframe-resident communication and command interpretation module and a PC-based set of query generation and communication programs. It provides bidirectional communication between the personal computer and host, as well as file transfer, query, and search capabilities. The product converts the output of file searches into formats that can be read by all Ashton-Tate products, including Framework. The conversion from the mainframe's EBCDIC character set to ASCII is handled at the mainframe end, while the actual creation of a *dBASE II* database happens in the PC.

This new product will be supported by both Ashton-Tate and Informatics General, with a combination of field sales reps and a specially-trained technical support team. Since this product will be sold primarily to data processing and MIS managers, there is a heavy emphasis on control and security.

At the mainframe end, the database administrator in the large data center has extensive control over the databases available to *dBASE/Answer* and can further control access by user and workstation. Individual fields, and even ranges of data within fields, can be granted or denied access based on the user profile. For example, employees might be denied access to the salary fields of their bosses, but able to see salaries of subordinates. The product includes advanced features to protect itself against unauthorized access from stolen or copied disks.

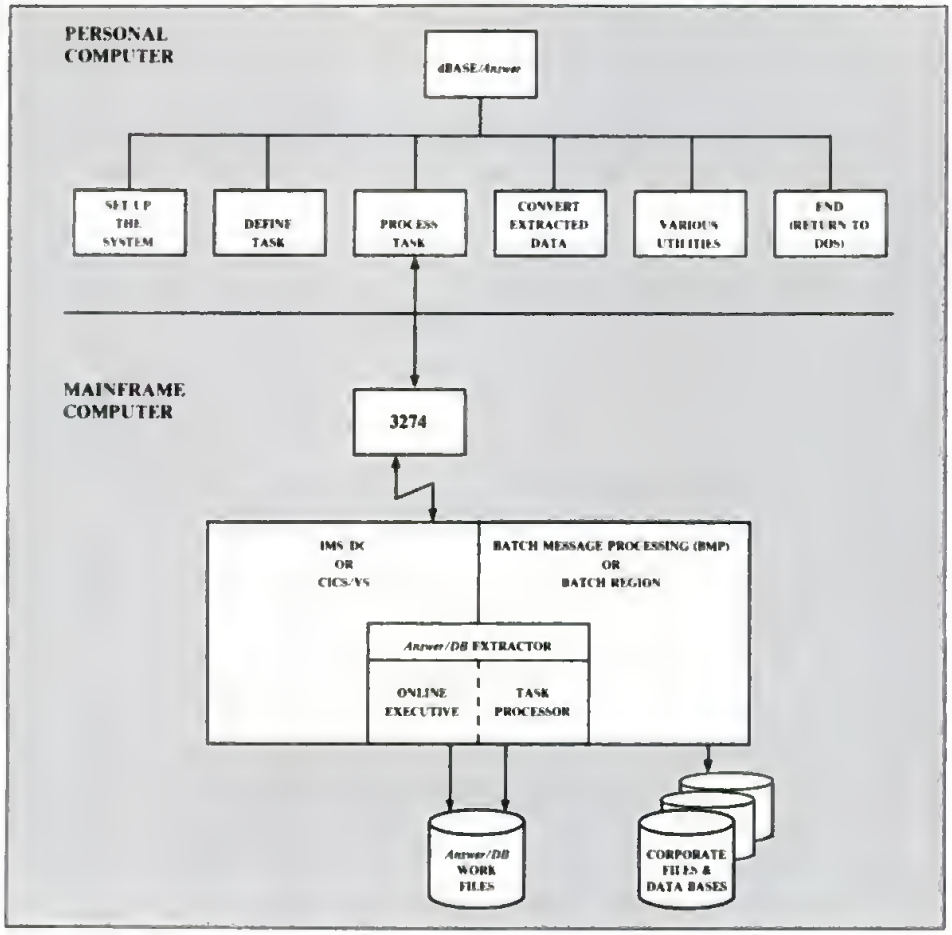
Looking Everywhere

"Unlike existing micro-to-mainframe products," said Merritt M. Lutz, Informatics' vice president, "we're not selling applications, nor is *dBASE/Answer* application-dependent." Indeed, *Answer/DB* can read virtually any kind of mainframe file, including IMS, IDMS, ADABAS, and VSAM. Installation of the package on a mainframe is reported to be less than 2 days' work.

"This product is perfectly positioned," stated David C. Cole, president of Ashton-Tate. "We've anticipated local-area networks and we've anticipated the corporate workstation." In addition to *dBASE/Answer*, Cole was referring to the multi-user version of *dBASE II*, available on 3Com's Ethernet LAN.

Last year, Informatics teamed up with VisiCorp to produce a similar product, *Visi/Answer*. It transfers mainframe data to *VisiCalc* files.

A typical *dBASE/Answer* installation, consisting of 50 PCs and one mainframe, will cost approximately $45,000. The product has been beta tested in a number of large computer sites and is scheduled for release in late June. ■



Low Prices!

EXPANSION

AST RESEARCH
All AST RESEARCH boards include SuperDrive and SuperSpool software.
MEGAPLUS II — Expands to 512K with 256K MEGAPAK or to 348K with 128K MEGAPAK. Includes CLOCK/CAL & 1 SERIAL PORT.
W/64K 285.00
W/256K 450.00
128K MEGAPAK 220.00
256K MEGAPAK 310.00
OPTIONS (2nd serial, parallel or game) ... 40.00
SIX PACK PLUS — Expands to 384K, includes CLOCK/CAL, PARALLEL & 1 SERIAL PORT.
W/64K 285.00
W/384K 560.00
OPTIONAL GAME PORT 40.00

QUADRAM
All QUADRAM boards include Quadmaster, print spooling and disk emulation software.
NEW QUADBOARD — Expands to 384K, includes 1 SERIAL, PARALLEL, GAME & CLOCK.
W/64K 299.00
W/384K 599.00

SEATTLE COMPUTER
All SEATTLE COMPUTER RAM + boards include FLASH DISK software.
RAM + — Memory & 1 SERIAL PORT
W/64K 210.00
W/256K 375.00
RAM +3 — Expands to 256K, includes CLOCK, 1 SERIAL & PARALLEL PORT.
W/64K 254.00
W/256K 419.00

RAM CHIPS

RAM CHIPS — All RAM chips from Micro Match are the highest quality components available anywhere. Every RAM chip comes with Micro Match 90 day exchange warranty.
64K set of 9 (200 nsec) 59.00

PRINTERS

EPSON PRINTERS
RX-80 Parallel 285.00
FX-80 Parallel 525.00
FX-100 Parallel 699.00
OKIDATA PRINTERS
ML 84 Parallel 1979.00
ML 92 Parallel 475.00
ML 93 Parallel 765.00
NEC PRINTERS
2050 Spinwriter (parallel) 995.00
3550 Spinwriter (parallel) 1750.00
DYNAX PRINTERS
DX-15 Parallel 499.00

AND over 1,000 other products for the IBM PC. If you don't see what you need, give us a call.

DISK DRIVES

All floppy disk drives are double sided, double density and include complete installation instructions and all hardware.
CDC 9409 ..... 249.00
TANDON TM 100-2 ..... 239.00
SHUGART FA-455 (half height) 239.00
FLOPPY DISKETTES
DYSAN 2 sided, double density. Box of 10 . 43.00

MODEMS

HAYES MODEMS
SMARTMODEM 300 ..... 235.00
SMARTMODEM 1200 ..... 525.00
SMARTMODEM 1200B (internal) 455.00
SMARTCOM II software 99.00
CABLE for external modems 27.50

DISPLAYS

AMBER SCREEN DISPLAYS
AMDEK 300A for color card 169.00
AMDEK 310A for mono card 185.00
COLOR DISPLAYS
AMDEK COLOR II+ 499.00
PRINCETON HR-12 ..... 495.00

SOFTWARE

ASHTON TATE
dBASE II 390.00
BPI
ACCOUNTING MODULES (each) 365.00
CONDOR
CONDOR 20-III 389.00
IUS
ACCOUNTING MODULES (each) 379.00
LIFETREE
VOLKSWRITER 1.2 ..... 135.00
VOLKSWRITER DELUXE 199.00
LOTUS
LOTUS 123 Version 1A 335.00
MICROPRO
WORDSTAR 315.00
INFOSTAR 315.00
MICROSOFT
WORD WITH MOUSE 299.00
PEACHTREE
PEACHPACK (series 4, GL/AP/AR) 249.00
ACCOUNTING MODULES (series 8, each) 445.00
SORCIM
SUPER CALC 2 ..... 195.00
SUPER CALC 3 ..... 259.00
VISICORP
VISICALC iV 175.00

AND over 1,000 other products for the IBM PC. If you don't see what you need, give us a call.

MICRO MATCH — SPECIALIZING IN THE IBM PC — THE ONLY NAME YOU NEED FOR COMPLETE IBM PC SUPPORT

MICRO MATCH gives you the best in hardware and software products for the IBM Personal Computer, at the LOWEST possible prices. You also get all the support you need, including service, free installation (walk-in customers only), and advice. If you know what you want your PC to do but aren't quite sure how to do it, give us a call. We'll give you your best MICRO MATCH.

Ordering

800-345-4706

California

818-352-3253

Technical Support

818-353-5929

ORDERING — Our ordering lines are open Mon-Fri 8-5 and Saturday 10-4. To order by mail, send check or money order. Mastercard and VISA accepted (include card number, expiration date and signature). Include shipping and handling with payment. California residents add 6½% sales tax.
SHIPPING — All orders shipped UPS unless otherwise specified (continental US only). For other destinations, contact us for best way and price. For printers, displays and hard disk systems, add $10.00 plus 2% of purchase price for ground freight ($25.00 maximum). For air freight, add $15.00 + 3% of purchase price ($35.00 maximum). For all other items, add $3.50 for ground and $8.00 for air freight.

All items are subject to availability. Prices are subject to change without notice.

Send for our free Catalog & Buyers Guide

48 pages of products, descriptions and technical information, make selecting the right product as easy as 1-2-3. The only catalog dedicated to the IBM PC.

MICRO MATCH *Quality Products*
Personal Computer
10049 Commerce Ave. • Tujunga, CA 91042 (818) 352-3253

CIRCLE 301 ON READER SERVICE CARD

Something Totally New in Applications Software From Borland, The Folks Who Make Turbo Pascal.©

SIDEKICK

ALWAYS JUST A KEYSTROKE AWAY . . .

"SOMETHING TO RELIEVE THIS MESS!"

If you've ever found yourself searching for a calculator or a notepad when you've got a computer right in front of you, then you know why we came up with Sidekick©.

WHETHER YOU'RE RUNNING 1-2-3, WORDSTAR, dBASEII OR WHATEVER . . .

JUST A KEYSTROKE AND A SIDEKICK WINDOW OPENS . . .

- **A CALCULATOR**
- **A NOTEPAD**
- **AN APPOINTMENT CALENDAR**
- **AN AUTO DIALER**
- **AN ASCII TABLE**
- **AND MUCH MORE**

ALL AT ONCE . . . OR ONE AT A TIME. ANYWHERE ON THE SCREEN YOU LIKE.

ANOTHER KEYSTROKE, AND YOU'RE RIGHT WHERE YOU LEFT OFF IN YOUR ORIGINAL PROGRAM!
(you never really left!)

SIDEKICK
INTRODUCTORY OFFER
$49.95
Available only for the IBM PC, XT, jr and Compatibles

Something brand new. Crafted in Assembly language as carefully as Borland's famous Turbo Pascal©, so that it's lightning-fast and as compact as only Borland knows how to make it! With a notepad that has a full-screen editor that saves your notes to disk. You can even swap information back and forth between your applications software and your Sidekick©.

Suppose you're working with a spreadsheet, and you suddenly have an important idea. Just hit the button, a window opens, you write the note and hit the button again. You're right back where you left off in the spreadsheet.

Need to make a phone call? Whether the number is in an existing database, your own Sidekick phone directory, or you've just typed it on the screen . . . put the cursor next to the number, hit the keystroke, and Sidekick dials for you!*

There's lots more, too. You can move the Sidekick windows anywhere on the screen you like. And you can have as many on screen at a time as you need.

We designed it because we needed it. If you've ever been writing a report and needed to do a quick calculation, or jot down a note, then you understand why.

*Only with Hayes Smartmodem and compatibles.

YOU CAN ORDER YOUR COPY OF SIDEKICK® TODAY!

For Visa and MasterCard orders call Toll Free **1-800-227-2400 ext 953** in California **1-800-772-2666 ext 953**
(lines open 24 hours, 7 days a week) Dealer and Distributor Inquiries Welcome 408-438-8400

SIDEKICK® $49.95
(plus $5.00 shipping and handling • Shipped UPS)

Check ☐ Money Order ☐
VISA ☐ MasterCard ☐
Card # _____
Expiration Date _____

Please be sure your computer is an IBM PC, XT, jr, or *true* compatible!

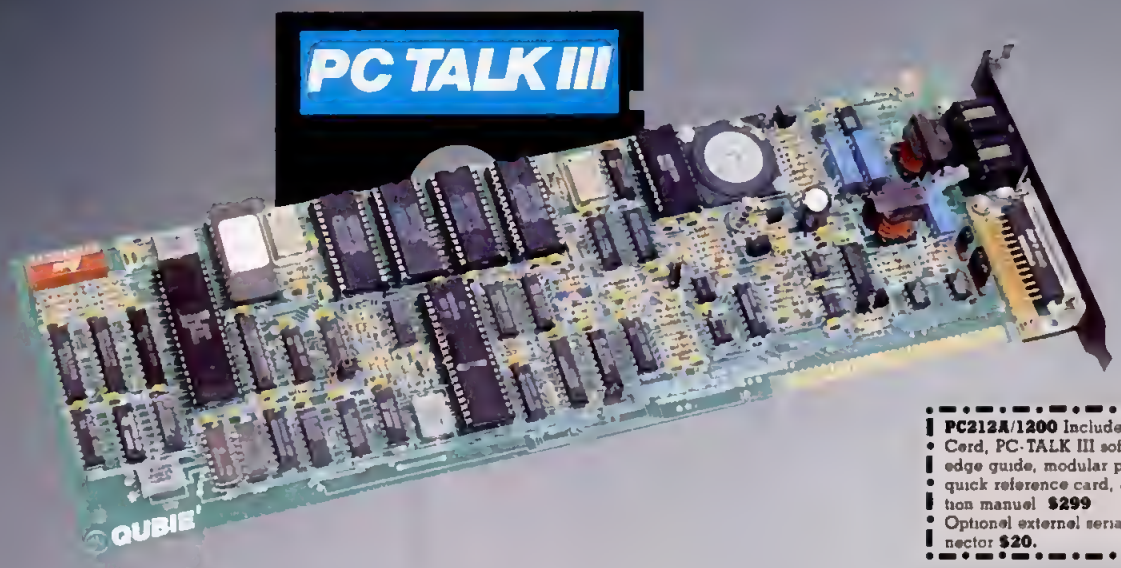
NAME _____
ADDRESS _____
CITY/STATE/ZIP _____
TELEPHONE _____

California residents add 6% sales tax. Outside U.S.A. add $15.00 (If outside of U.S.A. payment must be by bank draft payable in the U.S. and in U.S. dollars.) Sorry no C.O.D. or Purchase Orders.

SD7

BORLAND INTERNATIONAL
Borland International
4113 Scotts Valley Drive
Scotts Valley, California 95066
TELEX 172373

Thinking of buying a modem? Inside You owe it to yourself to check



PC212A/1200 Includes Modem Card, PC-TALK III software, card edge guide, modular phone cable, quick reference card, and instruction manual **$299**
Optional external serial port connector **$20.**

Just a few years ago, computers needed big air-conditioned rooms to operate in, balefuls of money to buy, and a team of wizards to keep them running. The constant march of technological progress has given more and more powerful machines which cost less and less. Desktop computers more powerful than the early mainframe computers are the result of the evolution. The Qubie' modems represent the latest extension of this progress. Because up until now, a 212A compatible modem cost at least $500. Through the use of four low-cost, state of the art microprocessors, we can now offer two versions of our full featured 212A modem at prices the competition sells 300 baud modems for.

In The Beginning

In September of 1983 we introduced the first 212A modem card for the IBM PC available for under $300. The PC212A/1200 is a complete communications package including PC-TALK III software, modular phone cable, card edge guide, and instruction manual. The modem is an auto-dial, auto-answer type, which uses all the Hayes software commands so it can be used with any of the popular software packages including Crosstalk,™ and Smartcom.™

We picked the best software package we could find based on it's ease of use and features, PC-TALK III. Our modem includes features the old industry standard missed out on. Like being able to fit in one slot in a Portable PC or PC/XT. Or an optional connector to use the modem's serial port when not using the modem. Of course the topper is the $299 price, hundreds less than the competition.

Our standalone modem, the 212E/1200 can be used with any computer or terminal with a RS-232C serial port. You can use any Hayes compatible communications software on anything from an Apple to a Zenith. Many owners of IBM PC's are using it because they lack available expansion slots, or have more than one computer they want to use their modem with.

It's attractive gold anodized case houses seven status lights (who says low prices means a shortage of features). It fits comfortably under a standard telephone. It is also a 212A compatible auto-dial, auto-answer modem which supports all Hayes software commands. Even the switch settings are the same, so any software giving recommended switch settings for a Hayes modem can be used, without knowing

Outs

out the Qubie' 212A modems.

212E/1200 Includes: Standalone modem with cable (specify male or female), modular phone cable, and instruction manual **$329.**

what the switches do. There is a volume control knob for easy adjustment of the speaker's output. Included in the package is modular phone cable, a cable to hook it to your computer or terminal, and instruction manual. Choose the communications package right for your needs, and you're ready to go!

Four Hearts

The heart of the Qubie' modems are four digital signal microprocessors. Two handle sending, and two do the receiving. Rather than attempt to filter all but the relevant tones used for modem communications, the microprocessors measure the tones digitally. This allows them to overcome line noise and static better than analog filter based modems.

Why Buy From Qubie'

Because you will get a product as good or better than any available, pay less for it, and get factory direct help if you need it. If at any time during the one year warranty period your modem should require service, we will fix it or replace it within 48 hours. Notice also there are no hidden charges in our prices. No extra for freight, insurance, credit cards, or COD fees. In a hurry? UPS 2nd day air service is just $5 extra. If you are like many who say, "Nah, it's too good to be true," just apply the acid test and find out. Then you will be asking yourself, "Why should I pay what these modems used to cost?"

The Acid Test

Qubie' gives you a 30 day satisfaction guarantee on your modem. If you are not completely satisfied we will refund the entire amount of your purchase including the postage to return it. If you can, get anyone selling another modem to give you the same guarantee. Buy both, and return the one you don't like. We know which one you will keep.

IBM is a trademark of International Business Machines Corporation
Crosstalk is a registered trademark of Microstuf Inc
PC Talk III is a registered trademark of The Headlands Press Inc

Order Today, Shipped Tomorrow!

All prices include UPS surface freight and insurance. Add $5 for two day air service. For fastest delivery send certified check or credit card. Personal checks take 18 days to clear. Calif. residents add 6% sales tax. Corporations and Institutions call for purchase order details.

(800) 821-4479
Toll Free Outside California

(805) 987-9741
Inside California

QUBIE'

4809 Calle Alto
Camarillo, Ca. 93010

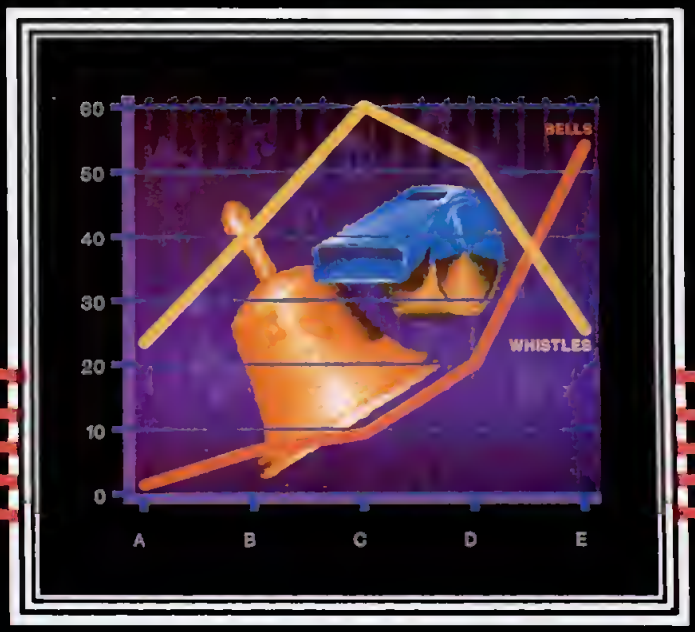
Tempo House, 15 Falcon Road,
London SW11 2PH, United Kingdom

Copyright Qubie 1984

CIRCLE 333 ON READER SERVICE CARD

IF YOU'VE GOT THE "PC"...

...WE'VE GOT THE "BELLS & WHISTLES"!



Presentation graphic produced on an ARTRON® STUDIO COMPUTER® System, by Scott Lewczak, using ARTRON® MERGE® software, combining images produced with ARTRON® "PAINT" software and ARTRON® AUTOMATIC DATA ILLUSTRATOR/ADI® software
© 1984, Artonics, Inc.

Artron

STUDIO COMPUTER™ SYSTEMS

Our "bells and whistles" transform your "PC" into the most powerful, versatile, and economical graphics design workstation possible. Take your standard 256K RAM "PC", add our PC-2000 Studio Computer™ System, and create high-resolution, professional-quality slides, overheads, ink-jet prints, and videotape. Our growing product line transports your "PC" into the colorful world of tomorrow — at prices you can afford today. Artronics™. . . travel with us into the future.

Artronics Sales Corporation
A subsidiary of Artronics, Incorporated
300 Corporate Court, P.O. Box 408
South Plainfield, New Jersey 07080 USA
Phone: 201-756-6868 / Telex: 757-214 ARTRON UD

Artronics

. . . THE GRAPHIC SOLUTION™

© Copyright 1984, Artronics, Incorporated "ARTRON", "ARTRONICS", "STUDIO COMPUTER", "MERGE", "AUTOMATIC DATA ILLUSTRATOR/ADI" and "The Graphic Solution™" are all trademarks and/or service marks of Artronics, Incorporated

CIRCLE 102 ON READER SERVICE CARD

Keypads as Much Fun As Compatibles at CES

Canon hops on MS-DOS platform with packed $2,500 compatible system

BY MARTIN PORTER AND PHIL WISWELL

CHICAGO—The computer game version playing at the recent Consumer Electronics Show (CES) here was the PC-compatible one. Canon announced they're on the hand-wagon, and everyone else talked about getting on-board.

The Canon 16-bit, 256K MS-DOS $2,500 system is expected in October and could be seen on the show floor running Lotus' *1-2-3* and Microsoft's *Flight Simulator*. The machine has two half-height Canon disk drives and is packaged with MS-DOS, GW BASIC, five I/O slots, standard serial and parallel interfaces, and a full 83-key, PC-lookalike keyboard.

Industry observers also expect Canon to announce a low-cost laser printer as part of their fall marketing push. Not on the floor, but previewed for software designers, was the Amiga Corp. PC-compatible, which the joystick company dubbed the "ultimate game machine," with a $1,500 to $2,000 price.

Atari Talk

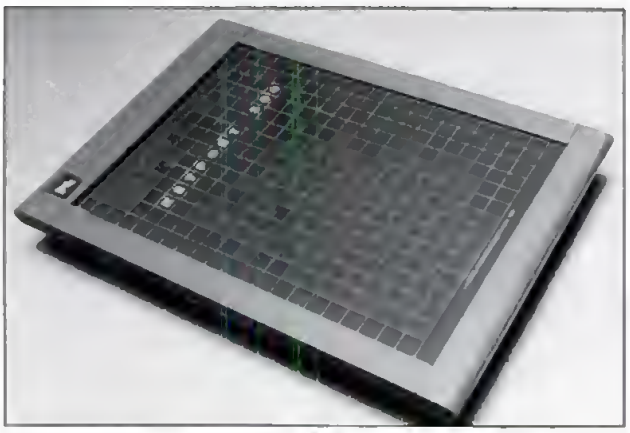
Atari discussed the forthcoming 1090 XL expansion system, which the company said would increase all Atari machine memories by 64K and allow them to accept up to five expansion cards. David Ruckert, Atari marketing director, said the slots could be used to make the machines "MS-DOS or CP/M compatible," defining the compatibility as "non-100 percent."

There were several new input devices:

● The Keyport 300, which the company described as "a friendly computer input device," is a touch tablet with 300 squares or keys allowing the user to run complicated applications programs from the tablet with single keystrokes. The initial $299 package includes the tablet, three colorful plastic overlays for word processing, spreadsheet, and graphics, and the software that drives the tablet with these operations.

Heart of the Product

The utility and beauty of the Keyport 300 lie in the Keyware, the overlay/software combinations that facilitate the operations of programs such as *WordStar*, *1-2-3*, and *Logo* as well as BASIC. All available functions of the software being used are clearly labelled on the overlays, which eliminates the need for screen menus and prompts.



You don't have to memorize any CONTROL or FUNCTION keys, and you can run the programs with very little reference to the manuals. For example, deleting a row from a spreadsheet is as simple as pressing the key on the overlay labelled "delete row."

The Keyware for spreadsheet programs comes ready to run *Multiplan*, Lotus' *1-2-3*, and *VisiCalc*, with more on the way from Polytel. Similarly, the word processing Keyware works with *WordStar*, *Word*, and others.

The Keyport 300 plugs into the joystick port of any game controller card, and measures roughly 9 × 12 × ½ inches.

● Suncom, Inc., also demonstrated a new touch tablet, the Animation Station, for drawing, manipulating graphics, and playing games at home. The $150 rectangular tablet, measuring about 7 × 9 × 2 inches, is exactly proportioned to a television or monitor screen for optimal use of the drawing surface, unlike the Koala Pad. (However, the tablet will run all Koala software.)

Power Buttons

The tablet has a grid pattern to aid placement of the plastic stylus when drawing, and every function is controlled by two buttons. Conveniently for left-handers, there is a set of buttons on both sides of the device. Uniquely, Animation Station switches from drawing mode to joystick emulator mode for controlling games.

Pixit is the software that comes with the tablet. It gives you all the commands of other drawing tablets, but goes one step farther by including a library of shapes, musical notation, and type faces that can be used like "clip art." Text and graphics can be mixed at will. And anything you create with the Animation Station can be dumped to a printer for hard copy.

● Koala Technologies introduced Speed Key, a touch tablet with overlays to support popular programs such as *1-2-3*, *WordStar*, *Multiplan*, *SuperCalc*, and the "Calc" packages. ■

No More Dullsville for Disks

FRESNO, Calif.—After you add a color display and color printer to your system, why not go all the way and add color to your disk drive? Most diskette makers have stuck to Henry Ford's Model-T philosophy that "you can get them in whatever color you want, as long as it's black," but Centech diskettes are now available in 13 colors from American Media and Supply, a company headed by Kelly Black in California's Central Valley.

The first bloom of colored diskettes included five bright colors: fire-engine red, canary yellow, sky blue, bright orange, and leprechaun green. If these sound too flashy for your desk, Centech disks now also come in five subdued hues for business environments: brown, tan, maroon, dark blue, and gray. Just as some ice cream stores list chocolate, vanilla, and strawberry as an afterthought, the three remaining disk colors are black, white, and a lavender that "is so bright that I'm surprised anyone buys it," says president Black.

At first glance, putting color on diskettes seems as frivolous an enhancement as painting candy stripes on perfory (the official name, by the way, for the perforated strips on tractor-feed printer paper). According to Black, however, nearly every customer has a different problem that a little color would solve.

An individual can use different colors to tell program disks from data disks, to identify different drafts of a document, or to identify data from different months or regions. A teacher could see across the room to tell if students are all using the right disk.

Where several users share the same machine, they can keep their disks separate by each using a different color (a meeting to decide who uses

(continued)

PC BRAND™ HAS UNBEATABLE

C has rapidly become the language of choice for serious software developers. The language of maximum portability across the spectrum of today's personal computers. The language which will most rapidly adapt to tomorrow's machines. The companion language to Unix™, the operating system destined for predominance. Major companies such as Microsoft and Micropro know this. They have switched to C for their applications development. How ready are you for the future?

PC Brand has the complete line of today's finest professional C tools. Not just the finest compiler, but libraries for graphics and screen design, overlay linkers, and program editors acclaimed as the best of their kind. It is a complete workshop of craftsman's tools which will turn you into a C professional in a hurry; capital equipment which will pay back your investment many times over.

Take the time to read this advertisement. You are sure to see the competitive edge these products will deliver.

LATTICE C

The Preeminent 16-bit C Compiler

You can find a more economic way to learn C, but if your interest is program development, Lattice C™ is the unparalleled choice. *Byte* said "the Lattice C compiler produces remarkable code . . . outstanding in terms of both execution speed and code compactness". After reviewing nine compilers for the PC, the *PC Tech Journal* unequivocally declared Lattice C "best for software development . . . it compiles fast and produces fast programs".

Lattice C is a full implementation of Kernighan and Ritchie, not a subset, and even offers extra features such as nested comments, 39-character variable names and extra compile time checks for some of C's subtler errors. The compiler comes with a full library of I/O routines which implement under MS™-DOS most of the Unix-compatible standards described by Kernighan and Ritchie.

Lattice C runs on virtually any computer using an 8086 or 8088 microprocessor, and we carry two versions for either PC-DOS™ or CP/M-86™. Create your source files with any word processor or text editor like Edlin or our Pmate™ and Lattice C will compile them into Intel 8086 object module format ready for linking with other modules by linkers such as DOS' Link or our Plink86™.

Lattice C offers a choice of four memory models which allow the program designer to choose the right combination of efficiency and size for an application: a range between 64K and a full megabyte for program and data area size.

The documentation, which *Byte* says "sets such a high standard of excellence that others don't even come close", features sample source programs and covers the interface to assembly language and machine dependencies.

C's structured approach encourages development of tight, fail-safe functions which can be counted on to return reliable results every time. Local variables unknown outside of functions to safeguard against collision. Extremely powerful nested expressions which produce elegant, concise code.

Requires 128K RAM.

For PC-DOS: Product Code: S0100
For CP/M-86: Product Code: S0120 Our Price:
Suggested Price: **$500.00** **$295.00**

HALO

A Spectacular Graphics Extension to Lattice C

Halo™ will astound you. It provides a complete library of graphic functions which can be linked with your Lattice programs to create full-color charts, graphs, simulations, even animation.

Over 100 commands are at your disposal, including plot, line, arc, box, circle, plus single commands to produce bar graphs and pie charts. Pattern-fill and dithering commands give your graphics impressive texture and color mixes, rubber-banding draws shapes for interactive users, area moves produce animation, fill and flood commands paint areas. The newest version allows you to define your own world coordinate scheme, divide the screen into "viewports" (windows), and scale graphic figures automatically.

It's a long list of capabilities which make for an extraordinarily powerful product. In fact, Halo is so good that manufacturers of graphics boards and systems are adopting it as a standard graphics language. So it can bridge your application to other systems. CAD-CAM developers, especially, have embraced its device-independent approach for maximal portability.

Halo is a dazzling demonstration of why C has become the language of choice among programming professionals: its function library architecture means you can tremendously enhance your firepower by acquiring libraries of software like Halo with dramatic economy of time and money.

Requires IBM monochrome or color graphics card or equivalents.

Product Code: S0300 Our Price:
Suggested Price: **$200.00** **$125.00**

PMATE

The Programmer's Word Processor

Pmate was designed for programmers. We'll wager that you cannot find a programmer who has discovered Pmate and moved on to something else.

Pmate is a full screen editor with ten auxiliary buffers for squirreling away pieces of text until needed. It uses single key commands to move the cursor, or text, or insert or delete, or rescue several thousand characters of deleted text.

It has a format mode for tab setting or wraparound and shaping when it's time to write documentation. Pmate lets you assign chains of commands or strings of text to single keys: one keystroke could set up the entire shell of a new C function, for example.

Pmate has variables, if-then statements, loops. It calculates, and converts decimal to hex to binary and back. You can write compact programs (called "macros") to delete comments, for example, or check syntax, or process long sequences of commands. Macros can alphabetize lists, do row and column math, perform a series of operations on multiple files, even summon other macros.

Put another way, Pmate is a text editor with its own built-in interpretive language. A language you can use to completely customize this text editor to your fancy. Possibly the most artful, ingenious program you have ever seen.

Product Code: S0600 Our Price:
Suggested Retail: **$225.00** **$175.00**

PLINK86

Overlay Linkage to Expand

Software is becoming ever more sophisticated, which means more complex programs requiring large chunks of memory. But if you use extra memory, if you count on users to have expanded RAM, you will forego sales to those who do not.

Plink86 is the answer. It takes on the job of shoe-horning large programs into small memory. First, Plink86 acts as an alternative to DOS' Link. For a language like C which encourages design of separately compiled object modules in the Microsoft relocatable format, Plink86 pulls modules together into single compiled programs. But Plink86's overlay power is what has gained it a reputation as a miracle worker. It binds into the compiled program its overlay manager which knows how to swap modules of your large linked program between disk and memory, so that each can temporarily occupy the same memory space.

Unlike other linkers, the overlay manager acts on its own, needing no calls from the source program. Instead, Plink86's straightforward overlay description language allows you to describe your overlay structure in one place in your program — a structure

VALUES FOR 'C' PROFESSIONALS

Equip Your Workbench with Our Precision Quality Craftsman™ Tools

C-FOOD SMORGASBORD

A Menu of Difficult to Prepare C Functions

C is a language of function libraries: sturdy routines which your application can effortlessly reference to get the job done. But someone has to write them. It would take months to concoct and perfect the complex and useful servings which have been prepared for you and thoroughly tested in C Food Smorgasbord™.

Decimal Arithmetic: Functions to perform operations on binary-coded decimal (BCD) numbers of up to sixteen significant digits. Includes trigonometric and logarithmic functions, powers, conversions to strings, and much more.

Level 0 I/O Functions: Enable you to perform direct I/O operations for screen, keyboard, printer, and asynchronous port with no dependence on higher I/O functions to minimize memory usage and maximize speed.

IBM™ PC BIOS Interface Access: Allows you to get at the basic I/O services in the ROM BIOS not available through the normal operating system to get and set the video mode, cursor position, color and screen attributes, keyboard shift, scrolling, printer channel and port status.

TIP, the terminal independence package: Lets you easily move programs to computers with different types of terminals.

There is a basket of delicacies beyond this brief list; a cornucopia to sample, any one of which will save valuable time and pay back far more than C-Food Smorgasbord's overall price.

Product Code: S0200
Suggested Price: **$150.00**
Our Price: **$115.00**

All products operate on the IBM PC or PC/XT under PC-DOS and require no more than 64K of RAM unless indicated.

Prices, terms and specifications subject to change without notice.

Prices do not include shipping and handling.

You may freely use these products to create software applications for re-sale without additional licenses or royalty payments, provided your applications are not wholly or substantially replications of the products themselves.

Unix ™ Bell Laboratories / Lattice C and C-Food Smorgasbord ™ Lattice Inc. / MS ™ Microsoft Inc. / Halo ™ Media Cybernetics / IBM ™ International Business Machines / Float87 ™ Microfloat / Panel ™ Roundhill Computer Systems Ltd / Plink86 and Pmate ™ Phoenix Software / CP/M-86 ™ Digital Research

PANEL

Are You Still Coding Hand-Made Data Entry Screens?

Designing custom screens is intricate, time-consuming, and costly. It can make you the loser in competitive bidding. It can add weeks, even months to bringing your product to market.

But not when you use Panel™. Put Panel to work and you hire a superprogrammer for the minimum wage. Telling Panel your screen design is like using a word processor. You can add, move, copy, delete, and reshape fields with single key commands. The result? Finished C program code with field descriptors, color and highlighting, input editing by type of field, help keys, and warning messages.

Panel can also create a terminal selection program customized for your application, and gives you a utility to quickly test your finished screens. It even includes a multi-key data file maintenance program which interacts with the screen you design. All the tools you need to generate code for the trickier aspects of your application, or even to create stand alone data entry and retrieval products without *any* programming.

Panel routines are powerful. Unlike so many programs which make error correction difficult once a field is departed, Panel gives the user full field-to-field movement for editing, and overtype or insert/delete within fields.

A truly superior productivity tool every developer should have.

Product Code: S0400
Suggested Price: **$295.00**
Our Price: **$235.00**

Your Art of the Possible

permitting up to 4,095 overlays stacked 32 deep. And you don't have to re-compile to re-arrange the structure.

Plink86 is a two pass linkage editor. On the first reading it determines all modules which need loading, to insure greater flexibility in assigning memory segment addresses before the disk file is created on the second pass. It can even sub-divide its linked output into multiple files for programs which must span more than one disk.

But most of all it sets you free to write the comprehensive code today's users have come to expect without sacrifices to memory constraints.

Product Code: S0500
Suggested Price: **$395.00**
Our Price: **$315.00**

FLOAT-87

Software Support for the 8087 Math Chip

Float-87™ is a library of floating-point math routines which are merged into a Lattice C interface library. The routines handle all arithmetic functions and the most frequently used transcendental or trigonometric functions, and pass all numbers to the 8087 to take advantage of its 80-bit data format.

Putting Float-87 to work with an 8087 can increase the speed of floating-point calculations by 40 times or more — and with greatly expanded accuracy. If you or your customers have an Intel 8087 math processor chip on board, this software will switch on its afterburners.

Product Code: S0700
Suggested Retail: **$125.00**
Our Price: **$100.00**

CIRCLE 310 ON READER SERVICE CARD

You won't find an offer like this elsewhere: Exceptional prices and software fully supported by a knowledgeable staff specializing in 'C' and companion tools.

1-800-PC BRAND

That's 1-(800) 722-7263. In NY State call (212) 410-4001.
Charge your purchase to MasterCard or Visa.
Or mail your order and check to
PC Brand, P.O. Box 474, New York, N.Y. 10028

© 1984 PC Brand

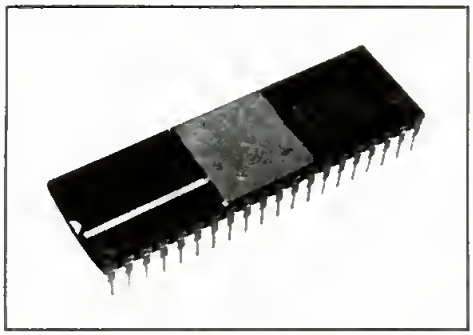
PC Brand and Craftsman are trademarks of PC Brand

THE 8087 IS IN STOCK!

Micro Ware is the world's leading retailer of 8087s. We also have the most accurate statistics on chip reliability. They are: .01% infant mortality, .00% adult mortality and .02% 8088 incompatibility. As for ease of installation, we have never had a customer return a chip because of bent pins. We are so confident that you will be able to successfully install and use the chip that we offer a 180-day warranty with every chip we sell. That's 90 days more than anyone else!

To support the 8087 we stock the largest selection of of 8087 software anywhere. This includes: three FORTRANs, three PASCALs, APL, Intel's ASM86, PL/M-86, several Cs, 87BASIC, 87MACRO and MATRIXPAK. For real time or multi-user applications we offer RTOS™ – our implementation of Intel's iRMX executive. Our new products include a professional debugger with 8087 support, an interface library which enables MS Fortran users to call the IBM Basic Compiler Library, and a translator that converts object modules into readable assembly language files. If you have a question about which computer, language, compiler, operating system or application package is best suited to your problem, we can answer it. Just call:

Information and Orders—
617-746-7341
University, Corporate and Government Buyers—
617-746-7364



8087 Support from Micro Ware

87FORTRAN/RTOS™ - our adaptation of the Intel Fortren-86 Compiler generates in line 8087 code using all 8087 data types including 80-bit reels end 64-bit intergers. Tha compiler uses the Intel lerge memory model, allowing code/data structures of e tull magabyte, and supports overlays. Includes RTOS and support for one year **$1350**

87PASCAL/RTOS™ is Intel's ISO-Standard Pascal with 8087-8088 exceptions. These make it possible to use all the 8087 data types directly, while generating modules in one of the three Intel Memory Modals. Includes RTOS and support for one year **$1350**

RTOS DEVELOPMENT PACKAGE includes 87FORTRAN, 87PASCAL, PL/M-86, Utilities, TX Screen Editor and RTOS . . **$2500**

RTOS—
REAL TIME MULTI-TASKING/ MULTI-USER EXECUTIVE
RTOS is a Micro Ware configured version ot iRMX-88. Includes ASM-86, LINK-86, LOC-86, LIB-86, end the ROM Hex Loeder . . **$600**

MWS-286™ Configured to your specifications, our computer runs RTOS-286 or XENIX. Includes one Intel compiler, seven slot multibus chassis, hard disk, streaming tape backup and Intel Service Contract. Six to twenty times taster than your PC . . . . . **CALL**

Micro Ware not only provides quality products but also the support to make them work. Our users receive newsletters, tree software updates, and have access to a hotline for 8087 related advice. Micro Ware is your complete cleaning house for 8087 related products. We sell the chips, compilars and applications programs you need et affordable prices. Call for our complete catalogue.

PC TECH JOURNAL REVIEW:
"The Micro Ware package is preferable ... it executes the basic operations more rapidly and Micro Ware provides a free update service."

87BASIC™ includes patches to the IBM Basic Compiler and both runtime libreries for USER TRANSPARENT and COMPLETE 8087 support. Provides super tast performance for all numeric operetions including trigonometrics, transcendentels, addition, subtraction, multiplication, and division **$150**

87BASIC/INLINE™ generates inline 8087 code! Converts the IBM Basic Compiler output into en assembly language source listing which allows the user to make additional refinements to his program. Real expression evaluations run five times faster than in 87BASIC **$200**

87MACRO™ - our complete 8087 software development package. It contains a "Preprocessor," source code for e set of 8087 mecros, and an object library of numeric functions including transcendentals, trigonometrics, hyperbolics, encoding, decoding and conversions **$150**

87DEBUG™ - a professionel debugger with 8087 support, a sophisticated screen-oriented macro command processor, and trace feetures which include the ebility to skip tracing through branches to cells and software and hardware interrupts. Breakpoints cen be set in code or on guarded addresses in RAM **$150**

FOR→BAS™ - e library ot interface routines which allow MS Fortran programs to call the IBM Basic Compiler library and access features such as the RANDOM NUMBER GENERATOR, SOUND, PLAY, DRAW and SCREEN commands **$150**

8087-3 CHIP $175
including DIAGNOSTICS and 180-day warranty

64K RAM Upgrade $47.50

87/88GUIDE - an excellent tutonal on writing 8087 code and interfacing it with compilers. Full of code thet runs! **$30**

MATRIXPAK™ manages a **MEGABYTE!** Written in assembly language, our runtime package accurately manipulates large matrices at very fest speeds. Includes matrix inversion and the solution of simultaneous linear equations. Callable from MS Fortran 3.2, 87MACRO, 87BASIC, and RTOS . . . . . each **$150**

MICROSOFT FORTRAN 3.2 or PASCAL 3.2 - These IEEE compatible compilers support double precision and the 8087 . . . . . each **$259**

MICROSOFT C COMPILER includes Lattica C and the MS Librarian **$350**

SCO XENIX ™	$595
Unisource VENIX/86 ™	800
FLOAT87 for MS or LATTICE C	125
SuperSoft Fortran 66	299
Computer Innovations C86	345
STSC APL★PLUS/PC	500
TURBO PASCAL	45
TURBO PASCAL with 8087 Support . .	85
HALO GRAPHICS	CALL
GRAPHMATIC	125
ENERGRAPHICS	295
Professional BASIC	295
Kidger Optical Design Program . .	3000
COSMOS REVELATION	850
SuperCalc III with 8087 Support . .	CALL
MAYNARD WS1 HARD DISK	995
MAYNARD WS2 HARD DISK	1170
256K RAM CHIPS	CALL
MAYNARD ELECTRONICS Boards . . .	CALL

NO CHARGE FOR CREDIT CARDS
ALL ITEMS IN STOCK

Micro Ware
P.O. Box 79
Kingston, MA
02364
(617) 746-7341

You Can Talk To Us!

IBM PC is a registered trademark of IBM Corp. 8087 iRMX-86, LINK-86, FORTRAN-86, ASM-86, LOC-86, PL/M-86, and LIB-86 are trademarks of Intel Corp. 87FORTRAN/RTOS, e7PASCAL/RTOS, 87BASIC, e7MACRO, FASTPAK, MATRIXPAK, e7/eeGUIDE, RTOS, e7BASIC, and Microway are trademarks of Micro Ware, Inc.

WE DRESSED OUR UNIX* SOFTWARE FOR YOUR IBM PC/XT

Try it Risk FREE — the first AT&T-licensed UNIX implementation for the IBM PC/XT. Shipping since August 1983, Venix/86 is the popular choice among knowledgeable UNIX users and developers. Here's why!

Muiti-User Capability...
Share the same PC, disk, and printer with up to three users! Simply plug in a CRT and run.

Muiti-Tasking...
Edit a file, print a report, run a spelling check, format a diskette...all at the same time.

Berkeley Enhancements...
Including vi, termcap, more and the c shell.

Real-Time Extensions
With semaphores, raw and asynchronous I/O, priority, shared data, I/O page addressing.

Quad-Screen Windowing...
Featuring four unique and powerful windows.

MS-DOS Partitioning...
Keep your DOS files and programs!

*UNIX is a trademark of AT&T Technologies, Inc
Venix/86 implementation by VenturCom, Inc

Lean and Clean...
192K RAM, 3.5 Mbytes on disk. Proven reliability.

Applications...
Networking, word processors, database managers, spreadsheets, menu interfaces.

One Source with Unisource...
Unisource is the leading publisher and developer of UNIX software for the IBM PC/XT and compatibles, DEC Professional 350, Rainbow, Micro-11, PDP-11, VAX series, and NCR computers. All our packages are fully documented and supported by our 800 user hotline. Call for a complete information kit or to arrange your 30-day Risk FREE Trial of Venix/86. Unisource Software Corp. Department 4102
71 Bent St., Cambridge, MA 02141.
Telex 92-1401/COMPUMART CAM
CALL 617-491-1264

UNISOURCE

Getting UNIX Software Down to Business

CIRCLE 810 ON READER SERVICE CARD

Preview Pak Gives You Try Before Buy—Sort of

Demos at the price of blank disks in this no-risk software sampler

BY JAMES LANGDELL

SAN FRANCISCO—"First select the software, then select your hardware," is a rule suggested by many computer consultants. Now Preview Publishing Co. proposes an amendment: "First select the disks, then select your software."

That's the philosophy behind this company's Preview Pack—a package of ten BASF Flexy-Disks, priced as if they were blank. You could use DOS to format them, store data on them: and never realize that each disk had been ready to demonstrate an IBM PC software package.

Hidden Talents

But, surprise! If you stick around to see the Preview Pak disks strut their stuff, you'd see a very mixed bag of program types. The ten demos in the first edition of this sampler includes a spreadsheet (*SuperCalc*[3]), word processor (*Palantir*), database manager (Personal Pearl), personal and business accounting packages (*Personal Accountant* and *Solomon Series*), computer aided drafting (*AutoCAD*), and sales training (*The Sales Edge*), as well as a windowing system (*InSight*), and versions of the UNIX operating system (QNX) and the FORTH language (PC/FORTH). A booklet with several pages of information on each program—and rebate coupons worth up to $50—is included in the sturdy plastic ten-disk box.

Demo disks haven't been established yet as a major way for users to learn about software. Columnist John Dvorak—who is not easily amused—says the basic problem is that "demos are boring." Actually, most programs aren't very interesting in themselves—what's interesting is the work you create. The software you use fades into the background of your attention.

A demo that relentlessly labors at fictional tasks can't compete with an episode of "Hill Street Blues" for pizzazz. But if a demo lets you run a program close to the way you might actually use it—you could easily spend an interesting hour deciding if you wanted to bring that software into your life.

The quality of the demos in the first Preview Pak varies greatly. The difference is worth looking at, even though a demo's quality doesn't necessarily reflect the quality of the actual package. Some demos provide free use of almost complete versions of the programs; these were well designed for the Preview Pak user who sits down one-on-one with the demo.

Not as useful were demos that repeat simulated runs of a program, interspersed with advertisements for the product. These canned demos were obviously designed to run in booths at computer shows, so they feature a few flashy screens that try to catch the attention of strolling customers for at least 3 seconds.

Meet the Demos

In the first Preview Pak, the demo for *SuperCalc*[3] tells you about the program, but also lets you do everything with it except save data files and use a printer for output. The *Palantir* word processor demo also lets you do everything—even print—except save your texts on a disk. If you never write anything but first drafts, this *Palantir* demo is the only word processor you'd ever need. A steal!

The demo for *InSight*, a window managing system merely took the disk's own file directory, fit truncated parts into four windows, and did some flashy screen choreography as if those windows were the June Taylor Dancers. Did the canned demo give any indication of how the windows might be used in actual work, or even what applications could fit into the windows? Well, no. But when I hit Ctrl-Alt-Del to make the demo go away, the screen action merely paused and I found my keystrokes entered text in one of the windows. I experimented further and found that I could switch the cursor into any of the four windows to enter text. Unfortunately, neither the booklet, disk, nor randomly punched keys revealed anything else I could do with *InSight*.

The PC/FORTH demo doesn't show how to program with the FORTH language. Instead, it presents spectacular color graphics that show how fast programs written in FORTH can run. One sequence has a map of the world crossing the screen as if it was the spherical surface of a smoothly turning desk globe.

The first part of *The Sales Edge* demo lets you answer a series of questions about yourself and a potential customer, as in the real program, but the report the demo prints out is a canned text, which isn't influenced by your input.

Ten a Month

Preview Publishing plans to release a new Preview Pak every month, each with ten demos of different types of programs. According to Preview Publishing's marketing head, Dan Logan, editions of Preview Pak are booked solid into 1985 by manufacturers who want to distribute demos. Many software makers are creating demos of their products for the first time, now that Preview Pak provides a way to get their disks to interested users.

If you'd like to try the Preview Pak demos, or merely want a different source to increase your stockpile of spare diskettes, a box of ten double-sided disks costs $39.95 (plus $3 postage and handling). Subscriptions are $257.50 for six monthly issues or $515.40 per year. Contact Preview Publishing Co., P.O. Box 590359, San Francisco, CA 94159, (800) 443-0110 ext. 330A. ■

Dullsville *(continued)*

what color might be like the start of a Parcheesi game). A major bank, for example, now uses different colored disks in different departments. An insurance company with several incompatible machines provides disks of different colors for each system (perhaps red for Apples, blue for IBMs, and the yellow disk of Texas for TRS-80s).

Some software manufacturers sell their programs on Centech colored disks to discourage piracy by making the official disks more distinctive. One software company uses colored disks for in-house work to keep prototype versions of software from getting mixed up.

Color Quality

Are colored diskettes as good as the standard black models? Black claims his company sought out better than average materials and processing for its Centech disks, using 8.5 mil homopolymer material for the sleeves. "Anyone could put color on crummy diskettes," says Black, "but they'd still be crummy diskettes."

We've put the Centech disks through a few weeks of normal use with no ill effects, but haven't had a chance to do specialized tests that might show if fire-engine red disks run fastest or if leprechaun green disks hide valuable data on tracks following an end-of-file symbol.

To put some color into your drives, Centech disks are available in packs of ten disks. If you can't decide which colors you want, try the Rainbow Mix with two each of the five bright colors or the Business Mix with pairs of the five tamest tones. The list price for ten 5¼-inch double-sided disks is $45 ($36 for single-sided). Colored 8-inch disks are also available. For more information on Centech diskettes, contact American Media and Supply, 5769 N. Palm Ave., Fresno, CA 93704, (209) 431-1133. ***—James Langdell***

RGB-1400 FEATURES

- 700 Lines Resolution
- Super High Contrast/Non-Glare
- 32 Colors Selected from 4,096
- Selectable Color Sets
- Front Access Calibration/Control
- Test Signal Performance Verification
- RGB–Digital/Analog
- Compact Cabinet Design

The design of the RGB-1400 color display departs from the tradition of modified TV circuitry. The design concept is total ....encompassing the cabinet, heat extractor, circuit and control functians. A custom set of IC's has been designed to function with high speed video omplifiers driving o high performonce CRT to pravide the fastest, cleanest, purest color ovoiloble in persanal computer disploy history.

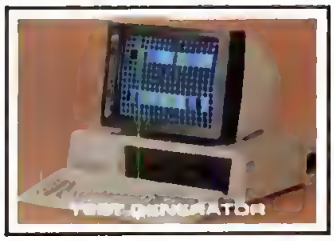
The RGB-1400 incarporates an Interfoce concept thot allows a variety of anolog ond digital signal compatible features.

Color selection is PROM controlled ond con be eosily chonged. PROM selected colors are disployed in the TEST mode.

The use af advanced SMD (Surface Mounted Devices) technalagy an thickfilms with 1% precisian resistars minimize the use of cantrols and enhonces circuit reliobiility and performance.

A unique tronsformerless isolatian circuit design reduces power, weight, size and interference allawing o compact cobinet design. Circuits provide for 16KHz, 24KHz or 31KHz aperatian with in-between scans available.

RGB
DISPLAY CORPORATION
22525 KINGSTON LN · GRASS VALLEY CA 95945
[916] 268-2222



INNOVATION FOR THE WORLD OF COMPUTER COLOR GRAPHICS

IBM is a registered trademark of IBM Corporation.

CIRCLE 391 ON READER SERVICE CARD

AND NOW, BESIDE YOUR TI PROFESSIONAL, TOO.

Beside Your IBM PC Or XT, The Best Box You Can Buy.

The Bernoulli Box:™ The Superior Storage Solution.

For owners and users of IBM PCs, XTs, and TI Professionals, where to put and secure the substantial amounts of data they are processing can get to be quite a problem.

Well, IOMEGA has quite a solution. We call it The Bernoulli Box.

Hard Disk Performance And Reliability. Flexible Disk Economy And Convenience.

The Bernoulli Box is a mass storage system that uses 10-megabyte removable cartridges to deliver incredible versatility and virtually unlimited storage capacity. Powerful primary storage. Quick and efficient backup. With the performance, data integrity, mechanical reliability, and low cost per megabyte equal to Winchester hard disks.

A Handful Of Cartridges Or A Desktop Full of Hardware. You Decide.

The bottom-line beauty of The Bernoulli Box is that when you need more mass storage, you buy more cartridges—not more iron. So you save space, time, money, and get higher performance and a more reliable storage solution to boot.

Check Out The Bernoulli Box Today.

Computer dealers know a good idea when it comes around. Many are currently stocking The Bernoulli Box in both single- and double-drive models.

For the dealer nearest you, contact IOMEGA at (801) 776-7330.

IOMEGA™

IOMEGA Corporation
1821 West 4000 South
Roy, Utah 84067
(801) 776-7330

CIRCLE 269 ON READER SERVICE CARD

PRODUCT REVIEW

OZ: Real World Management Control

OZ: Management Control
Fox & Geller, Inc.
604 Market St.
Elmwood Park, NJ 07407
(201) 794-8883
List Price: $495
Requires: DOS 2.0, IBM PC with two double-sided disk drives or XT with one double-sided disk drive, 256K RAM.

Fox & Geller, Inc. now has its own application package, *OZ: Management Control*, to help managers analyze financial information, and provide extensive report, consolidation, and graphic features.

The company is known for its popular utility programs *QUICKCODE*, *dGRAPH*, *QUICKSCREEN*, and *dUTIL*, all of which work with Ashton-Tate's *dBASE II*. Within the past year, Fox & Geller started producing standalone programs, including *Grafox*, a graphing program, and now *OZ*.

OZ meets a need that is not covered by the usual spreadsheet products, according to Fox & Geller Chairman, Jacob Geller. This program is set up to handle financial data, such as balance sheets and income statement accounts, so the user does not have to go through the lengthy process of creating a spreadsheet template.

A manager enters figures for the current and past year actuals, and current year budget and projections. Data may be entered as individual values or a progression of values based on a formula (such as the prior month's value plus 10 percent). Once the data is entered, changes may be made, and *OZ* will record up to three lines of notes explaining why the changes were made. A complete audit trail of changes is maintained, so that it is possible to recreate all the transactions that lead to the figures in each account line. There may be as many as 149 account lines in use at a time.

OZ contains 12 report templates that the user modifies and redefines to create up to 100 stored report formats. Data can also be reported as a graph, in line, bar, stacked bar, and pie chart formats.

A manager may also keep information for multiple divisions or departments, and consolidate the figures for an overall report. This feature uses a tree-structure to map out the organization, with each unit having up to eight "offspring." There may be up to 50 units in the structure.

Distributed Processing

Consolidation is made easier by the fact that the data files for the different organization units are kept in separate files. This means that *OZ* may be run on separate computers at different remote locations, and consolidated reports may then be compiled from disks sent to headquarters. Data may also be imported from DIF files and standard comma-delimited text files.

While Fox & Geller claims that *OZ* creates a new software category, it appears to be similar to other existing decision-support packages. It does not contain the calculation power of some others (such as *VENTURE*, see "Building Financial Models: VENTURE and PLAN 80" *PC*, Volume 3 Number 8). The graphics capabilities and ease of use do set *OZ* apart, however. Its many features provide so many ways to present financial data that a manager could easily be seduced into "playing" with the data forever.

OZ runs under DOS 2.0 or 2.1 on an IBM PC with 256K and at least two floppy disk drives, although it works much better on a hard disk. It supports either a monochrome or a graphics display, and can use both simultaneously to present tables of data and graphs. The program has a retail price of $495.

—Alfred Poor

'Singing in the RAM'

CHICAGO— The musical capabilities built into the IBM PC are more likely to inspire users to exclaim, "Pathetic..." than to attempt to write BASIC code for Tchaikovsky's "Pathetique Symphony."

Although the PC might have a great future controlling external synthesizers BASIC's own PLAY and SOUND commands can only coax out one note at a time and can't even control the volume. Even a PC*jr* or Commodore 64 let you play three notes at a time with greater expression.

Because of the PC's musical handicap, we were astonished when we heard a disk with five compositions, programmed by John Brink, that seemed to squeeze several voices out of the monophonic PC. He massaged the PC to play both melody and accompaniment parts in his faithful renditions of Chopin's "Minute Waltz" and Leoncona's "Malaguena." His version of Debussy's "Clair de Lune" had such a sensitive rubato that we suspected Brink must have respecified the tempo for nearly every note.

Brink, the president of Blackhawk Data Corporation, revealed a few of his secrets. You can fool a listener into hearing notes simultaneously if you program the lower notes to sound just before the higher melody notes, which are synchronized with the actual metric pulse. When the PC runs a Compiled BASIC version of programmed music, the computer responds fast enough for the high and low notes to sound almost at the same time.

Brink planned to sell a disk that PC users could treat like a record album; they could boot it up, then sit back and listen to his virtuoso repertoire of Compiled BASIC statements. Brink was discouraged, however, by friends who pointed out that no one had succeeded in selling software that merely played music, even though computer and phonograph disks are physically similar. Users appear willing to buy music software only when it lets them share the fun of composing.

To meet that market, Brink is preparing a "music editor"—the musical equivalent of a software text editor. It will include such capabilities as "play screen," which can be used like a Print Screen instruction. He'll also provide a guide with programming tips that helped him get advanced musical results out of the IBM PC. The program disks may include some of his musical arrangements, which users can listen to for inspiration. When ready, this package should be available from Blackhawk Data Corporation, 307 North Michigan Ave., Chicago, IL 60601, (312) 236-8473.

Although any PC*jr* could get two or three voices with less trouble, PC*jr* users could apply Brink's tricks to make IBM's prodigy sing with six voices.

Until Brink's musical package is ready, you can hear a preview that's now playing on the public-domain software circuit. He loaded his version of Chopin's "Minute Waltz" (renamed MINWALTZ.EXE) onto a Chicago-based bulletin board, and this selection is part of the repertoire of other bulletin boards and user groups. (To register for the Chicago bulletin board, contact Gene Plantz, P.O. Box 95638, Hoffman Estates, IL 60195.)

—James Langdell

Speaking of Computers: No Comment

"In absolute terms, today's personal computers are not very impressive." Apple's Macintosh, he added, "isn't so bad on a relative basis," but the IBM Personal Computer, which uses more conventional technology, "is beneath comment."

Alan Kay, upon resigning as chief scientist at Atari Inc. to take a top position at Apple Computer, Inc.
New York Times, *May 3, 1984.*

ATRON Announces A State of the Art Advance in Software Debugging—PC Probe

PROGRAMMERS AND MANAGERS know that finding bugs during new product development and over the entire product life cycle adds up to a significant portion of total product development cost and support time. Investing in the right debugging tools will greatly improve time to market as well as minimize development cost. Atron Corp has the right debugging tools for the PC environment. These are:

1) PC PROBE
2) SOFTWARE PROBE
3) PERFORMANCE ANALYZER

PC PROBE plugs into a PC or compatible. It is a total system debugger with features like:

Real Time Trace

Program flow is saved in trace memory while running at full speed. PC PROBE can display trace data as high level language line numbers, procedure names etc. — or as 8088 instructions. In addition, DMA cycles, interrupt lines and external logic probes can be traced. Real time trace answers the question "How did I get here"?

Memory Protection

What good is a debugger that can be wiped out by an undebugged program? PROBE software is write protected and can't be changed.

Hardware Breakpoints

The PC PROBE has 8 breakpoints and can trap conditions such as instruction execution, read, write, IO, DMA, interrupt, or external logic probes. Breakpoints can also be set on ranges of address or data — symbolically too!

Enhanced Human Interface

The PC PROBE designers know the importance of EASE OF USE. The PC PROBE interface has a menu window which displays the syntax of each command — so you never have to remember how a command works. It also recalls the previous invocation of each command to save tedious typing — and tedious thinking!

Symbolic Debugging

Avoid the tedium of sifting through link maps to find out where things are. The PC PROBE uses your C, PASCAL, assembly language program symbols.

Macro Commands

Why be limited by a fixed set of debugging commands? PC PROBE lets you create your own powerful macro commands with parameter passing, nesting, LOOPING and IF/THEN/ELSE control.

ANNOUNCING SOFTWARE PROBE

The same great software used on PC PROBE is now available separately as SOFTWARE PROBE —

ONLY $295

Software probe is the only software debugger available which provides a hardware reset and break box for program crash recovery. What good is a software debugger if you can't get control of run away programs?

PERFORMANCE ANALYZER

How do you find time critical program problems or know where to start performance tuning your software? Get Atron's new Software Performance and Timing Analyzer. Then you can display histograms of how your programs run — by time or by events. You can perform many different timing measurements.

Atron has many happy customers who have made critical product schedules because of PC PROBE. Why waste time on primitive debugging techniques? — Call us today and ask for your 12-page data sheet. Manuals also available for $25.

atron

20665 FOURTH STREET • SARATOGA, CA 95070 • (408) 741-5900

CIRCLE 156 ON READER SERVICE CARD

PRODUCT REVIEW

Advanced Report Manager Almost 'The Best Spreadsheet'

Report Manager,
Advanced Version
Datamension Corporation
615 Academy Drive
Northbrook, IL 60062
(312) 564-5060
List Price: $495
Requires: 128K, two disk drives

It's always a treat to see a fine product get even better. Version 1.06 of *Report Manager (RM)* was a good enough spreadsheet to be licensed to Martin Marietta Company as part of the IT series (see "Thumbing Through the Spreadsheets," *PC*, Volume 3 Number 7). The newly released Advanced Version is one of the most powerful spreadsheets now on the market and could bring more licencees.

Report Manager's great strength is its "data cube" concept, which allows users, not only to build spreadsheets in the usual column and row format, but to "stack" them in pages as well. The data cube can then be "split and rotated" to create new reports that display the same data in new and helpful ways (see "Report Manager, Not Just Another Visiclone," *PC*, Volume 2 Number 6). The Advanced Version now adds a host of new features.

Basic spreadsheet functions have been improved in several ways. All "slash" command options are now displayed as full words rather than as single-letter mnemonics, and the Tab key will now move the cursor to the next non-blank cell. It is also easier to enter data in long columns or rows: A three-stroke command will turn on or off a feature that moves the cursor one cell up, down, right, or left every time you enter data. A glance is now all it takes to determine the current cell address, because the row number and column letter of the cursor's location are highlighted on the coordinate grid. Also, since the Advanced Version is copyable, drive access time can be cut to next-to-nothing by running the program off a RAMdisk. Moreover, the Advanced Version uses live function keys instead of Report Manager's miserly one.

More Iterations

To *Report Manager*'s rich collection of functions, the Advanced Version has added two powerful iterative calculations. A new IRR function solves for internal rate of return, even if the cash flows are uneven and some are negative. The ITERATE function calculates the value of an independent variable that will result in identical values for two different dependent variables. Such a function could be used to calculate break-even sales volume, when both costs and revenues (dependent variables) increase with sales volume (independent variable) but at different rates. ITERATE would calculate the sales figure at which revenues were exactly offset by costs—that is, the break-even point.

The Advanced Version has also added a number of condition-detecting functions that can indicate if a cell is blank, has no value, is in an error condition, and whether it is a textual or numeric cell. Another new function indicates the number of characters in a text cell.

But the Advanced Version's most impressive new feature is a powerful sort routine. Data can be sorted by column, row, or page, in ascending or descending numerical or alphabetical order. Sorts may have up to three "keys," which are useful for breaking ties. If, for example, rows of sales data were being sorted in alphabetical order according to the name of the salesman, the second and third keys might be sales territory and sales volume. Thus, if several salesmen had the same name, their figures would be sorted by territory, a "tie-breaking" key. If there were salesmen with the same name in the same territory, their figures would be sorted by sales volume, a second "tie-breaking" key.

Sort commands can be long and tricky. A two-key sort might be specified thus: C,F=A1, T=J12, A=A6, D=A7. This would indicate a sort by *Column*, of the information contained in the block of cells *From* A1 *To* J12, with the first key to be an *Ascending* order sort on the value in row 6 and the second key to be a *Descending* order sort on the value in row 6 and the second key to be a *Descending* order sort on the value in row 7. Whew!

Fortunately, the Advanced Version makes it easy to invoke a sort command. You could store the whole thing as a text entry in any cell on the spreadsheet. When the program prompted you for a sort command, you'd just indicate the address of that cell and the program would read and execute the command.

Other complex commands can be issued by indicating the cell in which they are stored. The Advanced Version of *Report Manager* has a routine that lets you specify the control characters you would like to send to your printer before printing begins. Thus, if you wanted a report done in boldface italics you could store the necessary control characters in one of the cells. When the Advanced Version prompted you for them you'd respond with a cell address—a neat and easy way to do the job.

Another solid new feature in the Advanced Version is keyword search. The program can now look forwards or backwards for any string you specify. This can be especially handy for debugging ornery spreadsheets. Since the Advanced Version can be made to display formulas instead of values, you can search your whole spreadsheet for any reference to a particular cell or value.

New Utilities

Datamension has been hard at work in the unglamorous area of utilities as well. The Advanced Version can export and import DIF and ASCII files. It can also read columnar and delimited data from just about any source. All these dealings with "alien" environments can be by entire spreadsheet or by any portion you choose.

Since the Advanced Version lets you use the entire IBM character set for graphics, line drawings, and pretty borders, it also comes with character trans-

(continued)

PCjr Makes Its Charity Case

NEW YORK—If IBM wants to sell more PC*jr*s, it could learn something from educational television. WNET, a Manhattan public broadcasting station, held a fund-raising auction, starting the day after IBM cut the prices of its entire Personal Computer line. "By Design" was the theme of this auction, which offered what WNET's panel of taste-makers called "a museum-class array of superbly designed products."

Among the trendy bent-wood furniture, streamlined tea kettles, and high-tech desk lamps in the auction catalog was item #5508—an IBM PC*jr*. Apparently this much-maligned machine had impressed Channel 13's fashionable friends.

The ComputerLands of Long Island had donated the PC*jr*—an entry model with some accessories—valued at $784 before IBM cut its prices. As the end of the auction approached, the PC*jr* went on the block, and bidding began at a mere $375. (Earlier, a Kaypro II went off the block at $100 below its normal price.)

An hour later...triumph! The high bid was $920, well above the PC*jr*'s list price.

A moral victory for IBM...and a financial windfall for the cause of quality television. To get PC*jr*s into more homes and offices—at premium prices—IBM might do well to switch its sales strategy to auctioneering.

—James Langdell

Spreadsheet *(continued)*

lation tables for half a dozen popular printers. Since few printers can handle the full IBM character set, the printer tables turn unprintable characters into the closest printable equivalents.

The program even explains how you can use DEBUG to customize the printer tables if you want them to do something different, and if a table for your specific printer isn't included, you can use one of several generic printer tables that are also already on the program disk.

The Advanced Version has also beefed up EXEC, the internal *Report Manager* programming language. In addition to the gosubs, loops, counters, etc. that came with *Report Manager*, the Advanced Version has added a several new statements. The most significant lets you write EXEC programs that branch according to user command. Thus, if you have set up an automatic data-entry routine for naive users, you can include menus that let operators choose which kind of data to enter and which part of the program to go to. With several sets of menus and branching routines, you could set up very flexible and powerful data-entry systems. Also, EXEC routines can now be invoked from within spreadsheets, giving the Advanced Version a kind of macro-creation capability that the old *Report Manager* didn't have.

Reworked Manual

The manual has been entirely rewritten for the Advanced version, with mixed results. It is refreshingly clear about what the program can and can't do. You get no nasty surprises; the Advanced Version works the way the documentation says it will. But the manual takes the lazy way out by assuming that people who buy the program must somehow already understand spreadsheets.

The Advanced Version also makes little concession to the current craze for hanging databases, word processors, and snazzy graphics onto spreadsheets. Three-key sorts are the closest it comes to manipulating data, and though it pushes character graphics about as far as they will go, it can't handle such true graphics' tricks as pie charts and line graphs. What keeps these limitations from being too troublesome is the package's import/export utilities. The Advanced Version can talk to databases, word processors, and even graphics generators, so once it has done its magic, it can hand off the data to another specialized program.

The folks at Datamension haven't tried to make *Report Manager*, Advanced Version all things to all people. Instead, they have concentrated on building the best spreadsheet around. And if they haven't actually succeeded, they've come mighty close. —***Jared Taylor***

Calendar of Events

DATE	EVENT	COMMENT	LOCATION	CONTACT
July 16–17	Computer Security Workshop	Workshop on security needs and concerns of IBM, compatible users.	Marriott Crystal Gateway Arlington, VA	Computer Security Institute Dept. IP, Boston Post Rd. Northborough, MA 01532 (617) 845-5050
August 2–4	Great Southern Computer Show	Hardware, software, accessories targeted towards business end-users.	Civic Center Charlotte, NC	Great Southern Computer Shows P.O. Box 655 Jacksonville, FL 32201 (904) 356-1044
August 12–17	The Radcliffe Computer Publishing Course	Course on how computers are changing publishing industry.	Radcliffe College Cambridge, MA	Radcliffe Publishing Procedures Course 6 Ash St. Cambridge, MA 01238 (617) 495-8678
August 16–17	Local Area Networks	In-depth look at local area networks.	Ramada Inn-Old Town Washington, DC	Institute for Advanced Technology Control Data Corp. 6003 Executive Blvd. Rockville, MD 20852 (800) 638-6590 (301) 468-8576
September 5–7	National Software Show	Microsoftware-specific trade show.	Anaheim Convention Center Anaheim, CA	Raging Bear Productions 21 Tamal Vista, #175 Corte Madera, CA 94925 (800) 732-2300 (415) 924-1194
September 20–23	Userfest/New York	Hardware, software, accessories.	Madison Square Garden New York, NY	Northeast Expositions 822 Boylston St. Chestnut Hill, MA 02167 (617) 739-2000
October 29–November 1	COMDEX/Europe	Hardware, software, accessories.	RAI Congress and Exhibition Centre Amsterdam, The Netherlands	The Interface Group 300 First Ave. Needham, MA 02194 (800) 325-3330 (617) 449-6600

Even your favorite software can have annoying personal habits. Get ProKey.

If you're like most of us you probably own an IBM PC and a closetful of popular software. Maybe Wordstar, Visicalc, dBase II and a few others. And with each program comes its own peculiar protocol, commands and demands.

Suddenly you've become a personal slave to your personal computer.

Free yourself with ProKey.™

ProKey is unlike any other software because it operates just about any other software. So you can spend your time creatively while ProKey takes care of the tedious operational details. Silently, instantly, without errors.

ProKey can print spreadsheet tables, update databases, reformat reports and plot graphics and still leave you time to train for the triathalon or run out for a danish.

In fact, ProKey can memorize and execute anything you can type.

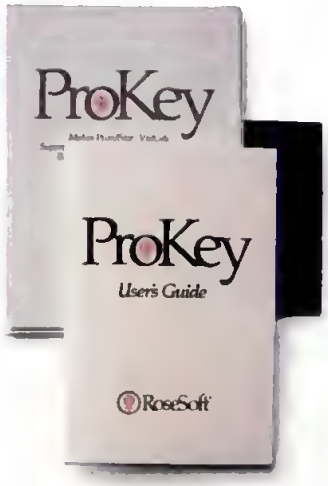
And no matter how extensive your software collection becomes ProKey controls them all, with one easy to remember protocol.

With all the time you save you'll be able to customize off-the-shelf software to your own personal or business requirements.

Ultimately you'll use ProKey as a "super-command center" operating your own software programs together to create a totally unique, incredibly creative system.

ProKey is available at most Computerland stores and wherever fine software is sold.

Once you use ProKey you'll never curse your cursor again.



RoseSoft, Inc.
4710 University Way, N.E.
Suite 601,
Seattle, WA 98105
(206) 524-2350

CIRCLE 438 ON READER SERVICE CARD

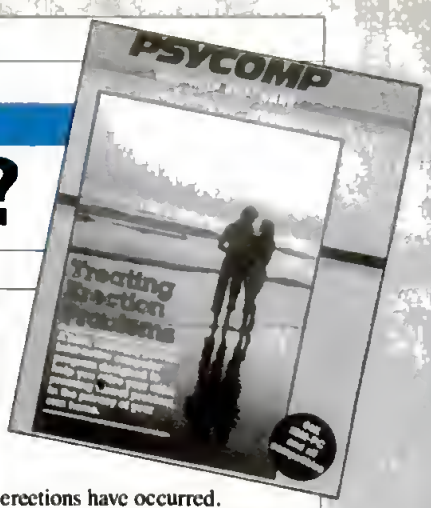
To run ProKey, you'll need an IBM Personal Computer or workalike DOS (any version, including 2.0), and 64K of RAM (WordStar requires 96K).

WordStar, VisiCalc and dBase II are trademarks, respectively, of Micro Pro, Visicorp and Ashton-Tate

PRODUCT REVIEW

Self-Help Software: Is It OK?

BY MARK MALAMUD



Coping with Stress
Handling Depressed Feelings
Treating Erection Problems
Psycomp
P.O. Box 994
Woodland Hills, CA 91367
(213) 992-4884
List Price: $89.95 each
Requires: 64K RAM.
one disk drive.

It had to happen. After all, psychological self-help has been a staple of the publishing industry for over 10 years. There's *Don't Say YES When You Want to Say NO; I'm OK. You're OK;* and *Making Friends with the Opposite Sex*, to name but a few. Since everything from cookbooks to emergency automotive repair manuals has been put on disk, it's not surprising that pop psychology has wended its way through digital tracks and sectors.

Self-Help on Disk

Psycomp is a California-based company formed in 1983 by Robert Reitman, Ph.D., to fill what he saw as a gap in the personal software market: namely, "psychological self-help for the masses of people who might otherwise not have pursued the needed therapy." Reitman is a licensed psychotherapist, a clinical member of the American Association of Marriage and Family Therapies, and a fellow of the Scientific Study of Sex. Psycomp is marketing three programs, all created by Reitman. *Coping with Stress* is available now, while *Handling Depressed Feelings* will be available in mid-July. *Treating Erection Problems* will be released in August.

Reitman says that his software is for those who might be too embarrassed by their problem to seek professional help, or for whom therapy is too costly an alternative. Each of his programs is based upon the theories of cognitive therapy, which contend that an individual's emotions and behavior are essentially determined by how he views the world. In other words, the way a person thinks determines the way he feels and reacts.

The instructions to run all the Psycomp software are easy to understand, and each program makes pleasant use of colorful graphics. Unlike some other self-help programs, however, Psycomp's software neither gathers nor analyzes much information about you. Instead, it leads you through a casual and effective monologue concerning the way thoughts control feelings and actions, and the means one can use to alter these thoughts.

When I finished running through the program sampler that contained introductory excerpts from the three software packages, I had many questions about the usefulness of Psycomp's self-help software. All three programs seem to be very similar in design and have only slight variations of focus for the different topics. My criticisms for all of these programs are best summed up by my overall reaction to *Treating Erection Problems*.

The cover for *Treating Erection Problems (TEP)* shows an attractive man and woman walking down a beach.

On the back of the package it says, "Your purchase and proper use of this program can help you regain your sexual confidence and once again enjoy a fulfilling sex life." There is also a note that the program is designed exclusively for men with psychological impotence problems.

I experienced my first reservations about the program here and wondered if Reitman had taken into account that it is misleading to categorize impotency problems into two groups: physiological and psychological.

The *TEP* sampler gives no hint of the true complexity of the problem at hand, and I wonder if the final version will address in more detail the need for a thorough vaseular, endocrinological, and psychiatric assessment to determine the full extent of an individual's problem. It is known that someone suffering from what might appear to be a psychological problem, in fact, might be experiencing a physiological problem. I can imagine the frustration and depression of someone like this who, without a physical evaluation, is lead to believe that his problem will improve just by "proper use" of Reitman's program.

Narrow Focus

Further, the *TEP* sampler seems to focus too narrowly on performance anxiety, a fear usually associated directly with performing the sexual act. Many other psychological influences may contribute to an individual's inability to have erections. For example, he may have a partner-related problem (say, a wife who hates sex), may have recently suffered a change in body image (due to an accident-related disfigurement or dermatological disease), or may have had a recent and dramatic change in financial status.

The program does not allow for enough deviation from its programmed path, and often you feel hemmed in by the forced direction Reitman's lecture must take. For example, in *TEP* you are led through a series of initial questions that force you (by offering no alternative choices) to admit that at worst you "rarely" have an erection in the morning when you awake, when you masturbate, or when you see pornographic materials. It is no surprise when *TEP* proudly proclaims you not fully impotent on the next screen. These questions and forced choices give no recourse to someone who truly has not experienced an erection during any of these situations or to someone who for some reason refuses to admit to himself that erections have occurred.

Reitman's simple proclamations appear in all the Psycomp programs, but they represent a rather tenuous cure. And in *Coping with Stress* the first request the program makes is that you choose from several inaccurate statements your definition of *stress*. There is no choice of "Other" here. After you've made your choice, the program goes on to say something like: "Ha! Fooled you. None of those choices was right."

Basically, from the sampler of Psycomp's first three programs, I concluded that self-help software cannot replace professional care and can, in fact, be detrimental to someone who believes his complex problem can be alleviated simply. A straightforward remark on the back of the box that the program is not a substitute for therapy might be in order. And finally, one must question the target audience to which Reitman has aimed his program. Will someone who cannot seek therapeutic help out of embarrasment be any more comfortable purchasing, say, *TEP* in his neighborhood software store? And for the limited range of help that one receives from Psycomp, an informative self-help book seems able to provide a more appropriate range of material and is less costly.

Psycomp's software is a pioneering effort in the field of computer self-help. For this, the programs deserve praise. The time when they will become comprehensive and truly effective, however, has not yet arrived. ■

Mark Malamud has degrees in psychology and computer science.

Copyright

What if your PC suddenly became faster, smarter and easier to use?

You're going to be hearing a lot about our new productivity software, Framework.™ You'll see business magazine ads and even TV commercials. But those aren't for you. They're directed at the first time PC buyers.

Right here is where you'll get the inside story on Framework.

Framework introduces a new generation of software. It's the logical step beyond spreadsheet-based integrated software like 1-2-3.™

Framework is for thinkers. It's an idea processor that's equally comfortable with words and numbers. Novices can learn Framework's unique outlining feature, word processing, spreadsheet, graphics, and database in a matter of hours. But what's really in Framework for you?

You can run PC DOS compatible programs like dBASE II® or 1-2-3 within Framework. You can write macros easier and faster than ever.

Framework has a full applications language named Fred,™ which is going to make it the hottest ticket for third-party developers since dBASE II.

And you can ignore all of Framework's friendly menus and HELP features for beginners, because Framework works even better and faster with power commands.

The more you know about software, the more amazed you're going to be when you see Framework.

ASHTON·TATE®

FRAMEWORK™

Framework. For Thinkers.

(213) 204-5570

CIRCLE 209 ON READER SERVICE CARD

© 1984 Ashton-Tate. All Rights Reserved. Framework, Fred, and Ashton-Tate are trademarks of Ashton-Tate. dBASE II is a registered trademark of Ashton-Tate. 1-2-3 is a trademark of Lotus Development Corp.

Copyrighted material

People in the News: James Johnson

Can one person psych out another? All you need is a PC, says Human Edge Software

BY CONNIE WINKLER

PALO ALTO—James H. Johnson is more cumplicated than most professionals who sit down to use the *The Sales Edge* or *The Negotiation Edge*.

"Isn't he a dynamo?" asks one Johnson acquaintance. Johnson, whu heads Human Edge Software, the company that produces the Edge self-help, expert system series, is—to say the least—eclectic.

In a three-piece navy suit and Gucci loafers, Johnson is still the IBM pitchman. But when the Hyperion that runs his demonstration blips, he's also the hacker digging into his disks to get it running again. Johnson is a zealot for his self-help programs, but he's also a teacher setting forth his theories of psychological assessment.

"Do you have a blackboard?" he asks, harkening back to his professor days. The *PC* offices yielding only a yellow legal pad, Johnson sets about drawing and explaining a 12 by 12 matrix of personality characteristics he's spent 15 years developing. Placed on the matrix axes are contrasting personality types, such as introvert/extrovert, neurotic/stable, and normal/hard-driving.

People can be described in terms of these characteristics, but there's nothing secret or devious ahout such answers, says Johnson, who has a Ph.D. in psychology and has been the director of clinical psychology programs.

Simple Quantification

It's simple observation, he explains: If your neighbor brings you a casserole when you're sick, you observe that he or she is a kind person.

Simple enough. But, Johnson's products are all about particular and often difficult human interactions involving a second person—making a sale or negotiating, for example.

The user of an Edge series package (who in more cases than not bought a PC specifically to run these programs), first steps through a series of up to 100 agree-or-disagree questions, cast in conversational English, that elicit information about the user's attitudes, situation, and goals. The user then answers a similar series of questions about a fellow employee,

customer, or opponent. The program analyzes and compares the two sets of personality information and generates an easy-to-read printout that walks the user through the anticipated scenario in a way that should achieve the optimum resolution.

Human Edge in Palo Alto has a knowledge-engineering team, including a Ph.D. psychologist, a writer, and programmers, who review all the literature on the subject they're investigating—all the advice on how to close a sale, for instance—and cull out the key points.

In the sales example, the key might be: "Make a presentation." Such advice is then bounced against the various personality types in the matrix. Here the expertise really comes to play.

Different personality types react differently to certain situations, Johnson explains. The extrovert sales rep is ineffective before the first cup of coffee; the neurotic/introvert goes zonkers if the sales rep opens with a booming presentation.

"The system gives you a step-by-step approach how to proceed with sales or negotiations," Johnson says.

Proposed Scenarios

Here's an excerpted output from a session with *The Negotiations Edge:*

As u negotiutor, Mary Dough is somewhat different from you. You are a confident, serious businessperson who enjoys new ventures and innovative deals. Though she also seeks out excitement, she often takes on too much and responds by becoming worried and agitated. Both of you are sociable people, though she tends to be more dependent on others for regard. You must be careful and direct in dealing with Mary Dough because she is easily upset. Take care to think before you speak.

What the user gets, says Johnson about the management series, is "Here is how life is, here is how to do the best you can. You don't want the most psychologically healthy person alive for certain jobs. If you had nothing but normals, this would be a dull, go-nowhere world."

Jello to IBM

Johnson got into computerized psychology in a logical, albeit roundabout way. Shortly after being hooted out of Berkeley during the Free Speech Muvement days (he was a graduate student in philosophy), he became a father. He made the big jump and went to work selling Jello.

Someone suggested that IBM Corporation was the place to make money and, after all, he'd already abandoned hippiedom. "IBM was nothing planned," Johnson recalls. "I just bopped through and they hired me." He was involved in a $10 million sale of a 1,000 terminal on-line system for a giant finance company.

Johnson took the IBM money and ran to graduate school in psychulogy at the University of Minnesota—he'd always wanted to be a professor. Fortuitously the department was sculpting the classic Minnesota Multiphasic Personality Inventory (MMPI) tests and Johnson had the complementary cumputer skills.

Grant money rolled in to study whether the computer cuuld evaluate psychiatric patients and lead to better patient care. Johnsun wrote lots of papers and gave lots of speeches un this potential. Everybody listened, but apparently nobody believed. Only Johnson.

Building Company

Johnson started his own company, Psych Systems in Baltimore, for computerized psychological evaluations. Psych Systems went public and he sold his holdings to launch Human Edge, which was incorporated in April 1983 and shipped its first product in December 1983. Sales have progressed well since then.

"We're tracking $5 million this year," Johnson says. "Obviously we are guing to have a public offering. We have tracked better than anybody else but Lotus."

To date, Human Edge's programs have been limited to business management strategies. But, Johnson foresees a how-to series—huw to fix your car, for instance—with as many as 300 to 500 programs.

Recent offerings, besides sales and negotiations include *The Management Edge* and *The Communications Edge*. So far, Edge users fit the profile of *PC Magazine* readers: Professionals with a high need to achieve, 70 percent of whom are owners or heads of their companies, and whu earn an average $50,000 to $70,000.

"In the beginning everybody is so skeptical," adds Johnson. "We have to get people to say, 'Hey, come over here and see this.'" ■

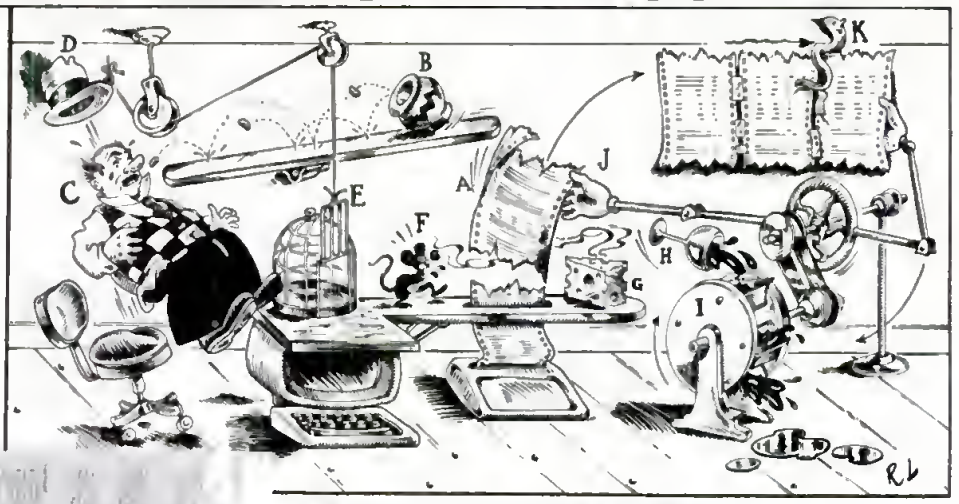
SIMPLIFIED SPREADSHEET ASSEMBLY

RISING SPREADSHEET (A) KNOCKS MEXICAN JUMPING BEANS (B) INTO MOUTH OF NEUROTIC MAN (C) WHO IS SO DISCOMBOBULATED THAT HIS HAIR STANDS ON END, DISLODGING HAT (D) WHICH OPENS CAGE (E) AND RELEASES EPICUREAN MOUSE (F).

MOUSE, INSPIRED BY SCENT OF PERFECTLY AGED CAMEMBERT CHEESE, GNAWS THROUGH SPREADSHEET, ONLY TO DISCOVER HE HAS BEEN FOOLED BY AROMA OF OVER-RIPE GORGONZOLA (G).

IN A FIT OF PIQUE HE SPILLS VINTAGE WINE (H) INTO WATER-WHEEL (I) WHICH TURNS PULLEY THAT CAUSES GLOVE (J) TO GRASP SPREADSHEET AND MOVE IT TO TAPING AREA.

SHEET IS TAPED SECURELY IN PLACE BY TRAINED ADHESIVE TAPE WORM (K).



MADE SIMPLE.

Now you can save time, aggravation, adhesive tape, and Gorgonzola cheese by following one simple direction—Sideways. It's the unique software program that lets you output all the spreadsheet columns you need, all on one continuous page, all with one print command—and all for only $60!

With Sideways on your side, no spreadsheet you invent with Lotus 1-2-3,™ VisiCalc,® Multiplan,™ or SuperCalc™ is too wide! And it's just as powerful an ally when you're creating far-into-the-future schedules and pert charts with your word processor. In fact, for any wide text file, for dozens of uses, the way to go is Sideways.

The experts agree. *PC* Magazine, for example, writes: "If you've got the need, Sideways has the solution." And *PC World* calls Sideways "nifty . . . . an easy to use program that does what it claims."

You can go Sideways today with an IBM® PC and an IBM,® Epson, Okidata, Prism,™ or Prowriter™ printer. Ask for Sideways at your local ComputerLand® or other leading computer stores. Or mail a $60 check to Funk Software, P.O. Box 1290, Cambridge, MA 02238. (617) 497-6339. MC/Visa accepted. Send no Mexican jumping beans, please.

SIDEWAYS™
FOR EASY-READING HARD COPY

CIRCLE 306 ON READER SERVICE CARD

FLOPPY DISK SERVICES INC.

FLOPPY DISK SERVICES, INC.
39 Everett Dr., Bldg D
Lawrenceville, NJ 08648
609-799-4440

LEADERS IN INNOVATIVE DISK DRIVE ENCLOSURES!

The **FD-PC8™** is a new 8" double-sided disk drive sub-system

IBM PC styling.

The FD-PC8 looks like your other IBM PC components. Same styling. Same color. Same dimensions. It stacks neatly under, on top of, or next to your IBM PC, and better still, is only one-half the height of standard 8" drives. Matches Z100 & others also.

2 Drive System—$1495 complete with cables.

SPECIFICATIONS

- Full one year warranty on materials and workmanship.
- Two fully assembled and tested Shugart double-sided 8" drives also available in one drive configuration.
- Exactly ½ the height of standard 8" drives.
- IBM PC styled and painted cabinet.
- All cabling included.
- IBM 3740 format compatible.
- No-mar rubber feet.
- Sturdy construction easily supports PC or monitor.
- Power supply designed for long life, trouble-free operation.
- Requires Maynard controller for use on PC.

NEW! FD-PC5™ IBM PC styling.

This versatile new disk drive enclosure comes completely tested and assembled with a 4" cooling fan, and is designed to offer a variety of mounting options, with the power supply rated for any of the following:

- **full-size floppy disk drive**
- **full-size hard disk**
- **one or two half-height floppy disk drives**
- **one or two half-height hard disks**
- **one or two 3.5" drives**

Full 1 year warranty—$295 cable choice optional

DISK DRIVES and other Goodies!

Shugart (1 year war.)

sa-712 10MB hard disk-half hgt	$795.00
sa-860 ds/dd half hgt 8"	505.00 2 @ 495 ea
sa-455 ds 48tpi ½ hgt 5.25"	245.00 2 @ 230 ea
sa-465 ds 96tpi ½ hgt 5.25"	295.00 2 @ 275 ea
sa-300 ss 96tpi 3.5 inch	265.00 2 @ 250 ea
sa-851 ds 8" full size	495.00 2 @ 480 ea

W.S.T. (formerly SIEMENS)

FDD-100-584 flippy 5.25"	235.00
FDD-211-5 D5 48tpi for PC	265.00
FDD-221-5 D5 96tpi full size	335.00
FDD-100-5C3 (sa-400 compatible)	175.00

Heath H-89 TWOET kit...
put 2 half height floppies internal to the H-89 with our exclusive mounting kit, call for details!

Maynard Electronics for the IBM-PC

Memory module (bare)	210.00
64K	305.00
128K	410.00
192K	510.00
256K	615.00
With serial port add	100.00
With 2 serial ports	160.00
Controller w/mod ports	265.00
FDC8 8" controller	245.00
Standard controller	$195.00
Controller w/par port	275.00
Controller w/ser port	285.00
Hard disk module	495.00
Modular board	110.00
Multidisplay (mono & color board)	575.00
PGS, HX-12 RGB color monitor	525.00
Magnolia controller for the H-89	375.00
Data connectors of all types	CALL
Power connectors for all drives	CALL

We offer a wide assortment of enclosure sizes, styles and systems, including both 5¼" and 8," IBM look-alikes, and more. All are well constructed, attractive and immediately available at competitive prices. Call for details and prices.

IMPORTANT NEWS!
We are moving, please take note of our address. Our new and expanded facilities will permit us to offer a higher level of service than ever before. Our growth is the result of your patronage; we thank you for it sincerely.

TERMS: MC, VISA, PREPAID. NO COD'S. PERSONAL CHECKS HELD FOR 10 DAYS. WE ALSO ACCEPT P.O.'S FROM MAJOR BUSINESSES & UNIVERSITIES, CALL FIRST.

Toll Free Order Line 800-223-0306 Ask for our free catalog.

CIRCLE 139 ON READER SERVICE CARD

"T" FOR TWO.

BUY OUR NEW ELEPHANT™ RIBBONS AND GET AN ELEPHANT T-SHIRT FOR JUST $2.00.

To introduce you to our new Elephant Memory Systems™ Ribbons, we're offering our unique Elephant T-shirt for just $2. Send in your proof of purchase along with the attached coupon and $2. We think you'll find our durable, high quality Ribbons will make your PC's printing look better than ever. And with our Elephant T-shirt, so will you. For the Elephant Ribbons dealer nearest you, call 1-800-343-8413. In Massachusetts, call collect (617) 769-8150.

Dennison

ELEPHANT™ NEVER FORGETS.

CIRCLE 137 ON READER SERVICE CARD

Mail this coupon and $2.00 (check or money order, payable to Dennison Computer Supplies, Inc.) plus proof of purchase of Elephant Memory Systems™ ribbons (serial number from the package and your cash register receipt with the purchase price circled).

To: Dennison Computer Supplies, Inc./T-Shirt Offer
320 Norwood Park South
Norwood, MA. 02062

Check size: ☐ small ☐ medium ☐ large ☐ x-large

Name _____
(Please print)

Address _____

City _____

State _____ Zip _____

Offer good in U.S.A. only, except where prohibited or taxed or otherwise restricted by law. Offer expires September 30, 1984. Allow 6 to 8 weeks for delivery. One order per envelope. Offer good while supply lasts.

PC 8/7/84

SELECTION. QUALITY.

Save space and protect your PC with our unique StowAway™ drawer

NEW!

The StowAway is a drawer which stores your keyboard when not in use, and a keyboard stand when the drawer is opened. Behind the keyboard is drawer space for disks, keyboard overlays, whatever. The keyboard stays connected at all times.

The rugged metal construction of the outer case allows 100 lbs. of computer equipment to stand on top. That's strong enough for three PC XT's. And the drawer is so sturdy, it easily supports the keyboard when extended beyond the desk edge.

The StowAway reduces the "footprint" of your PC. It allows you to install and run a PC on a space only 16 by 16 inches such as a narrow typewriter return. Our composite photo shows this: • above, a StowAway with an IBM PC on top and the keyboard tucked away in the drawer, • below, the StowAway by itself with the keyboard drawer extended. Version B (shown) locks the drawer with the keyboard in it, effectively disabling the computer to unauthorized users. Version C takes security to the limit. It bolts through the table top and clamps without harm to the PC (with access to its fasteners safe inside the locked drawer). Anyone wishing to make off with your computer will find a telltale desk hanging from it.

In style and color, the StowAway blends right in with your IBM® PC.

Version A: StowAway Housing & Drawer	X100A	$ 94.50
Version B: Plus Lock	X100B	$119.50
Version C: Security Bolts & Clamp	X100C	$169.50

Diskettes: top notch labels at rock bottom prices

We want PC Brand to become your source for supplies. So here's our inducement: only the premier brands, only at bargain prices. All the following are 5¼", soft-sectored, double density, with reinforced hubs. SS and DS stand for single- and double-sided:

Brand		Product	Box of 10
IBM	SS	D1101	30.90
IBM	DS	D1102	39.90
3M	SS	D1501	26.90
3M	DS	D1502	36.90
Maxell	SS	D2001	30.90
Maxell	DS	D2002	42.90
Memorex	SS	D2301	26.90
Memorex	DS	D2302	36.90
TDK	SS	D2801	30.90
TDK	DS	D2802	42.90
Verbatim	SS	D3201	27.90
Verbatim	DS	D3202	36.90

Ribbons for the most popular printers

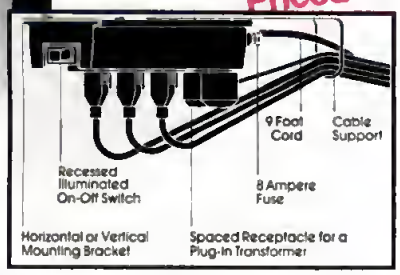
With our low prices you can afford frequent changes to keep your hard copies from going soft. Don't be stranded with an overworked ribbon when that important report comes along. Always be ready to make a good impression. Order several today for lowest prices.

Printers	Model	Product Nrs.	Price Each
Epson (IBM)	MX-FX-80	R0301	7.95
Epson	MX-FX-100	R0302	11.45
NEC	3550 M/S	R4001	17.50
Okidata	80,82,83	R2501	2.45
Okidata	Microline 84	R2502	8.50
Juki	6100	R3700	2.45

The Wire Tree™: Clean power *and* a clean desk!

Power spikes can erase memory, destroy disks, and damage equipment. They're not worth risking. Ask us for The Wire Tree to protect your computer's circuits from harmful voltage surges, and you will get all these features in the bargain: It can attach to the underside of a desk to remove unsightly power cords from view (see diagram), turns four components on and off with a single illuminated switch, has its own 8 amp fuse, and 9 foot cord. Product N0050 $49.95

Specially Priced



Paper in a mix of weights and measures

We stock full-size boxes and convenient mini-packs to fit your most likely requirements. 'Perforated lets you tear off the vertical pin-feed holes and yields smooth-edged 8½" by 11" pages for correspondence, filing, and notebooks. 20 lb is full thickness and bright white. 15 lb is for higher volume or economical printing.

	Size		Quantity	Weight	Product Nr.	Price
Full Boxes:	14 7/8" by 11"		2500 sheets	20 lb	P1420	39.95
	14 7/8" by 11"		3400 sheets	15 lb	P1415	44.95
	9 1/2" by 11"	Perf	2500 sheets	20 lb	P1920	28.95
Mini-Pack	9 1/2" by 11"	Perf	1000 sheets	20 lb	P0920	19.95

Our Craftsman™ programming tools will make you a 'C' professional

If you are a software developer, you know that C has become the language of choice among professionals. PC Brand has the complete line of today's most finely crafted C tools, and all of them at a full 20% off list price. Any selection from our Craftsman workbench will give your productivity a powerful boost.

Lattice C® : The preeminent 16-bit C compiler. It "produces remarkable code. . .outstanding in terms of both execution speed and code compactness" *(Byte)*. "The best for software development" *(PC Tech Journal)*. Supports DOS 2 Path Names and Large Memory model. Product S0100, $295.00

C-Food Smorgasbord™: A library of difficult to prepare C functions which would take months to write and perfect but which your application can effortlessly reference to get the job done. Product S0200 $115.00

Halo™: A spectacular graphics extension to Lattice C. Provides a complete library of graphic functions. Over 100 commands for plot, line, arc, box, circle, pattern-fill and dithering for impressive texture and color mixes; rubberbanding for shapes; fill and flood to paint areas. Extraordinarily powerful. Requires IBM Color Graphics card, Hercules card, or compatible equivalents. Product S0300 $125.00

Panel™: Designing custom screens is no longer intricate, time-consuming, and costly. Generates C source code supporting field descriptors, color and highlighting, input editing by type of field, help keys, and warning messages. Product S0400 $235.00

Plink86™: Shoe-horns large programs into small memory with overlay manager. Plink86 will set you free to write the comprehensive code today's users l sacrifices to memory constraints. Product S0500 $315.00

Pmate™: A full screen editor designed for programmers. Includes ten auxiliary text buffers, and Undelete. Pmate calculates, has variables, if-then-else statements, loops. You can write compact "macros" to delete comments, check syntax, alphabetize lists, do row and column math, even summon other macros. The most powerful editor available. Needs only 64K. Product S0600 $175.00

All products operate on the IBM PC or PC/XT under PC-DOS, require 128K (unless otherwise noted), and are fully supported by telephone assistance. If you already know these products, you recognize the dramatic savings we offer. If you need more information, we have complete specification brochures for each product. Just give

Prices, terms and specifications subject to change without notice. PC Brand, StowAway, and Craftsman are trademarks of PC BRAND.

VALUE. SPEED. OUR DIME!℠

Finally, a true letter quality printer for less than $500!

PC Brand pioneered this breakthrough price with the Juki 6100. Real daisy wheel typing, bi-directional logic, even proportional spacing for only $499.

80 Micro magazine "studied three other daisy-wheel printers under $800 and came to the conclusion that the Juki 6100 was by far the best choice. It's smart, has plenty of features. . . the print quality is excellent." That's because the Juki uses print wheels and ribbons designed not for computer printers but typewriters — where standards for "letter quality" are set. Smart? The print wheel simply drops into place, the printer engages it automatically!

Fast? The Juki is rated at 18 characters a second. But logic-seeking bi-directional printing and high speed motion over blank spaces means typing speed for typical text equals printers with much faster ratings. *Creative Computing* says "the Juki [is] much faster than other low cost daisywheels. . . the printhead absolutely flies over white space." And there is a built-in 2,000 character buffer.

Quiet? Better than 62 dBA from 1 meter away. No raucous clatter. A big improvement over some printers we listened to. We benchmarked the Silver-Reed EXP 550, Brother HR-1, and Smith-Corona TP-1 and found them two to eight times noisier. *80 Micro* agrees: "The Juki 6100 is one of the quietest daisy-wheel printers." Reliable? Ask an engineer about an MTBF of 2500 at 25% duty. Other printers employ intricate wires, pullies, and springs. They derail, and go out of adjustment. The Juki is elegantly simple, with few moving parts: the print head is drawn across a rail by magnetic attraction.

Versatile? It prints at 10, 12 and 15 characters/inch on a 13 inch platen (11 printable inches). Also supports proportional spaced print wheels. Under software control there are almost 50 codes for graphics, special type wheel characters, and even reverse direction paper feed. Spacing can be controlled up to 1/120th of an inch horizontally and 1/96th inch vertically for the fussiest forms printing. We offer an economical and reliable bi-directional forms tractor as an option for continuous stationery. Works with up to 7-part stock!

Compatibility? The Juki 6100 behaves like a Diablo 630 with your software, and has a parallel interface, fully compatible with your IBM PC, XT, or look-alike.

"In a feature-by-feature comparison, the Juki outstrips anything in its class" is *Creative Computing*'s conclusion.

So try it! There's a 90 day limited warranty for parts and labor. And if you don't agree that the Juki is an extraordinary value, return it within 30 days for refund of all but shipping and handling. Call us now.

Ribbons and print wheels for the Juki

The Juki uses low-cost single- or multi-strike IBM Selectric® II ribbons, and doubly-molded plastic Triumph Adler print wheels with up to 100 characters in 26 styles rated a phenomenal life expectancy of 10,000,000 characters. PC Brand has them all.

Juki 6100	
Product J6100	$499
IBM Cable	
Product J6120	$ 29
Bi-Directional Forms Tractor	
Product J6150	$129

A printer stand with a new angle NEW!

Printer stands put the paper under the printer to save space. This one, in clear Lucite™, tips your printer forward. You can read what it's printing without continually getting up and leaning over. Its height delivers fanfold output. Its open top U shape is perfect for printers which feed paper through the bottom. To fit your printer, choose the size which most nearly fits its platen (roller) length:

M0912	10"	platen (plus or minus)	$34.95
J1512	13"	"	$44.95
M1512	15"	"	$49.95

We make a great case for portability NEW!

Maybe not today, perhaps not tomorrow, but some day you will want to take your PC or XT with you, or ship it somewhere. That's when you will discover why portables have caught on. Yours isn't at all. Be prepared for that last minute situation. Our parallel line of carrying and shipping cases are fully foam padded and have industrial locks, corners, and frames for rugged durability.

	Carrying		Shipping	
PC or XT & Keyboard	T8314	$149	T8342	$229
Monitor & MX-80	T8315	$159	T8343	$239
Monitor & FX-80	T9666	$179	T9541	$259

Keep your disks safe from mishap

Of all the disk storage schemes we've offered, the Lock Box is clearly the favorite. Our two sizes hold 35 and 85 diskettes, have clear plastic covers, and two keys to discourage borrowing and unauthorized browsing. Protect your disks from spills, dust or smoke particles, and organize your workplace in the bargain.

V1035	$29.75
V1085	$42.50

CIRCLE 288 ON READER SERVICE CARD

1-800-PC BRAND

That's 1-(800) 722-7263. In NY State call (212) 410-4000.
Minimum order $20.00. Charge it to MasterCard or Visa.
Or mail your order and check to the address below.
Ask about corporate accounts. Shipping and handling extra.
PC Brand, P.O. Box 474, Dept. 7A, New York, N.Y. 10028. © PC Brand 1984

Q: How can you increase the capabilities of your PC and save thousands of dollars doing it?

A: RTCS Software Development Tools

Give your PC/MS-DOS based systems professional development capabilities with a family of operating software tools. Call RTCS today for detailed information. We'll show you how you can extend the capabilities of your PC for less money than you'd expect.

RTCS/UDI —
UNIVERSAL DEVELOPMENT INTERFACE
Run Intel Series III software on the IBM PC/XT and other MS-DOS computers.
MS-DOS is a trademark of Microsoft

PC/IRMX
Real-Time, Multiuser, Multi-tasking Operating System for IBM PC and others.
iRMX is a trademark of Intel Corporation

INTEL LANGUAGES
Pascal 86/88 Compiler
Fortran 86/88 Compiler
PLM 86/88 Compiler
C 86/88 Compiler
ASM 86/88 Macro Assembler

OTHER UTILITIES
Software Debugger
Hardware Debugger
Target System Development Link

INTEL UTILITIES
Link 86 Linker
Loc 86 Locater

Distributed in Japan by SYSCON CORP., Tokyo, Europe by MICRO-TECH ELECTRONICS, Paris; Israel by MLRN ELECTRONIC LTD., Zahia

REAL-TIME COMPUTER SCIENCE CORPORATION
SOFTWARE DEVELOPMENT TOOLS
ADVANCED OPERATING SYSTEMS

P.O. BOX 3000-886, CAMARILLO, CALIFORNIA 93011 • PHONE NO. (805) 987-9781 • TELEX 467897

CIRCLE 443 ON READER SERVICE CARD

3780/2780/2770

Emulation For Your IBM PC or PC/XT

Use With Your IBM BISYNC ADAPTER BOARD

ONLY 99.00 From

SOFTWARE DYNAMICS INCORPORATED
OF FLORIDA

*Add $5.00 per unit for shipping and handling

Box 247, Dunedin, Florida 34296-0247
(813) 733-8784

Here is what you get: IBM 3780/2780/2770 emulation distributed on single side/single dense 5¼" diskette. A detailed 150 page user document with binder, slip case and plastic diskette holder. Responsive technical support at no additional cost.

Here are a few major features:

- Only 64K of memory required with DOS 1.0 and 1.1. 128K of memory required with DOS 2.0.
- Transmit a single keyboard message, a single disk(ette) file, multiple concatinated disk(ette) files, a disk(ette) directory or an entire disk(ette).
- Run the program via a disk(ette) resident command file. Instructions within the command file may be selectively executed based on success/failure of previous link operation.
- Run attended or unattended (via command file) and log all executed commands with corresponding status.
- Execute commands issued from the local PC keyboard or execute commands issued from the remotely attached mainframe or PC.
- Terminate or swap diskettes if an overflow condition is detected while receiving a diskette file.
- Receive one or more files and automatically create a disk(ette) resident file or print on DOS supported printer.
- A special terminal mode allows copying of a single file or an entire disk from one PC to another. This includes copy of the disk(ette) directory name.
- Keyboard/CRT allows PC operator to querry mainframe for job status and perform other mainframe supported RJE functions.
- CICS feature allows connection to mainframe CICS system.
- Display writer feature allows PC to close current output file upon detection of specific data stream. Used when replacing CICS connected display writers.

CIRCLE 466 ON READER SERVICE CARD

DIAMOND DELIVERS!

The Total Solution
Full Service • Full Support
Low, Low Prices

This Month's Packaged Specials

Wordstar Pro Pack/ Lotus 123	$689	Multimate/Lotus 123	$619
Wordstar Pro Pack/ Lotus 123/dBase II	$1039	Microsoft Word/ Mailmerge/Mouse	$319
dBase II/Quickcode	$569	Mailmerge/Correctstar/ Star Index	$189
Wordstar/Mailmerge/ Correctstar/Star Index	$369	Easywriter II /Speller II / Mailer II	$199

dBase II	$call	Wordstar	$245	R:Base 4000	$329		LIST	SALE
Volkswriter Dlx	$179	Lotus 123	$call	Multiplan	$129	Rosesoft® PROKEY	$129	$ 89
Supercalc 3	$219	Multimate	$299	Symphony	$call	Software Publishing® PFS REPORT	$125	$ 85
						PFS FILE	$140	$ 95
	LIST	SALE	LIST	SALE		PFS GRAPH	$140	$ 95
Alpha Software® APPLE-IBM CONNECTION	$250	$139	Information Unlimited® EASYSPELLER II	$100	$ 59	PFS WRITE	$140	$ 95
DATA BASE MANAGER II	$295	$195	EASYMAILER	$100	$ 59	Sorcim® SUPERCALC 2	$295	$159
Ashton Tate® FRIDAY	$295	$199	GENERAL LEDGER	$595	$299	SUPERWRITER	$295	$159
Condor® CONDOR 3	$650	$349	ACCOUNTS PAYABLE	$595	$299	Supersoft® FORTRAN	$425	$299
Continental® HOME ACCOUNTANT	$150	$ 99	ACCOUNTS RECEIVABLE	$595	$299	Visicorp® VISIWORD	$375	$269
ULTRAFILE	$195	$125	INVENTORY CONTROL	$595	$299	VISICALC IV	$250	$199
Microstuf® CROSSTALK XVI	$195	$105	PAYROLL	$745	$379	AST Research® 9 PAK PLUS-64K	$395	$299
Digital Research®	$400	$249	Lexisoft® SPELLBINDER	$495	$275	ALL OTHER AST PRODUCTS		$call
PASCAL MT + 86	$350	$229	Lifeboat® LATTICE C COMPILER	$595	$319	Anchor Automation® SIGNALMAN MARK XII	$399	$269
CONCURRENT CP/M 86	$200	$135	Lifetree® VOLKSWRITER	$195	$119	Hayes® SMARTMODEM 1200	$699	$499
C BASIC 86	$150	$109	Micro Data Base® KNOWLEDGEMAN	$500	$329	SMARTMDDEM 1200B	$599	$429
PERSONAL BASIC	$ 60	$ 39	Micropro® MAILMERGE	$250	$135	Quadram® QUAOLINK	$680	$489
CP/M 86	$400	$249	INFOSTAR	$495	$259	QUADCOLOR	$295	$219
ACCESS MGR	$500	$329	CORRECTSTAR	$195	$ 99	64K EXPANDABLE BOARD	$395	$269
DISPLAY MGR	$ 95	$ 69	PLANSTAR	$695	$309	256K	$595	$409
DR LOGO		$call	INFOSTAR/STARBURST	$595	$299	QUADBOARD EXP. TO 384K	$395	$269
PC DOS LANGUAGES			STARBURST	$195	$ 99		$499	$355
Dow Jones® MARKET ANALYZER	$350	$295	SUPERSORT II	$200	$ 99	Hercules® GRAPHICS CARD		$ 57
MARKET MANAGER	$300	$219	Microsoft® MOUSE	$195	$139	MEMORY CHIPS (64K)		
Financier® FINANCIER II	$195	$119	WORD/MAILMERGE	$375	$249			
TAX SERIES	$150	$109	MULTITOOL FINANCIAL	$100	$ 59			
Fox & Geller® QUICKCODE	$295	$199	MULTITOOL BUDGET	$150	$ 99			
GRAFDX	$295	$199	PASCAL COMPILER	$300	$209			
dGRAPH	$295	$199	FORTRAN	$350	$239			
dUTL	$ 99	$ 59	C COMPILER	$500	$349			
Harvard Software® HARVARD PROJECT MANAGER	$395	$279	Monogram® DOLLARS $ SENSE	$165	$109			
			Professional Software® WORD PLUS W/BOSS	$495	$329			

TO ORDER
CALL TOLL-FREE
1-800-227-0545
Software Specialists For The IBM PC

- Special Corporate Incentives
- Cumulative/Quantity Discounts
- Same Day Shipment
- Overnight Delivery Available
- Purchase Orders Accepted From Qualified Organizations
- IBM,* CPM,* Apple* formats
- Expert Technical Assistance
- Full Product Guarantees
- Visa, M/C, Amer Exp
- Free UPS Surface w/Ppd Check

Diamond Software Supply

484 Lake Park Ave Suite 123 Oakland, CA 94610

For price quotes information, or in California call 1-415-893-7678 We credit your order for the call **Technical Department** (415) 893-7678 International Telex 338139 (attn 149)

IBM is a trademark of International Business Machines CPM is a trademark of Digital Research Apple is a trademark of Apple Computer Inc

CIRCLE 189 ON READER SERVICE CARD

OUR AD #P7

THE WORLD'S LARGEST COMPUTER MAIL ORDER FIRM

CONROY

ALL MAIL: Conroy-LaPointe, Inc. 12060 SW Garden Place, Portland, OR 97223
SHOWROOMS AT: PORTLAND, OR and SEATTLE, WA — BOTH OPEN M-SAT 10-6

HARDWARE for your APPLE

APPLE IIe, STARTER SYSTEM BY APPLE — CALL

APPLE MACINTOSH — CALL
LIMITED WARRANTY = 100% Parts & Labor for 90 days by us.

DISK DRIVES

AMDEK	Amdisk I, 3" Micro-Floppy, 143K	$ 299	$ 249
* CENTRAL PT.,	Filer, Utility& Apple DOS	$ 20	$ 15
μ-SCI MICRO-SCI	* A2, 143K Disk Drive	$ 345	$ 215
	A2 Controller Card	$ 100	$ 79
	* A40, 160K, Drive	$ 449	$ 259
	* A70, 286K, Drive	$ 599	$ 299
	A40/A70 Controller	$ 100	$ 79
1/2 HIGH DRIVES	ALPS, A40, Belt Drive, 163K	$ 299	$ 199
	TEAC, T40, Direct Drive, 163K	$ 349	$ 219
	TEAC, T80, Double Sided, 326K	$ 449	$ 329
	Controller Card by ComX	$ 110	$ 49
Rana	Elite 1, 163K, 40 Track	$ 379	$ 239
	Elite 2, 326K, 80 Track	$ 649	$ 399
	Elite 3, 652K, 160 Track	$ 849	$ 499
	Elite Controller	$ 145	$ 99

RAM EXPANSION

* ComX,	80 col. +64K RAM,for IIe, 1 Yr Wty		$ 199	$ 99
*	RAM Card, 1 Yr. Wty (II+)	16K	$ 179	$ 39
* Microsoft,	RAM Card (II+)	16K	$ 100	$ 69
* Titan/Saturn	RAM Card (II+)	32K	$ 249	$ 159
	RAM Card (II+)	64K	$ 425	$ 249
	RAM Card (II+)	128K	$ 599	$ 359
	Software			Call

VIDEO CARDS

* ComX,	80 col. +64K RAM(IIe) 1 yr wty	$ 199	$ 99
* Videx,	Videoterm 80 col. (+ or e)	$ 279	$ 169
*	UltraTerm (+ or e)	$ 379	$ 279
	Soft Video Switch (II+)	$ 35	$ 25
	Enhancer II (II+)	$ 149	$ 99
	Function Strip (II+)	$ 39	$ 29
We Have Full Videx Line. Call.		Up to 35% off	

MISCELLANEOUS

* ALS,	The CP/M Card V3.0(+ or e)SPECIAL	$ 399	$ 199
*	Z-Card II (+ or e) CP/M 2.2 SPECIAL	$ 169	$ 99
ASTAR,	RF Modulator, to use TV	$ 35	$ 25
* CCS,	Serial Interface 7710 (Set BAUD)	$ 150	$ 99
Chatsboard,	Power Pad	$ 100	$ 75
Digital Res.,	CP/M Gold Card (W/64K)	$ 495	$ 359
*	Expand 64K Gold Cd to 192K	$ 325	$ 239
* Eastside,	Wild Card (copier, II+ only)SPE	$ 110	$ 59
	Wild Card 2 (copier, + or e)	$ 140	$ 99
KENSINGTON,	System Saver	$ 90	$ 69
	Modem (Mac)	$ 140	$ 109
	Surge Suppressor (Mac)	$ 50	$ 39
	Starter Pak (Mac)	$ 90	$ 64
Key Tronic,	KB200 keyboard (II+)	$ 298	$ 218
Koala,	Touch Tablet w/Micro Illustrator	$ 125	$ 85
Kraft,	Joystick (Ap II/II+)	$ 65	$ 49
	Paddle(Ap II /II+)	$ 50	$ 39
M&R,	Sup R fan (+ or e)	$ 50	$ 30
* Microsoft,	Z80 Softcard (+ or e)	$ 345	$ 345
*	Z80 Softcard Plus (+ or e)	$ 465	$ 465
*	Z80 Softcard Premium(II+)	$ 695	$ 479
*	Z80 Softcard Premium(IIe)	$ 495	$ 339
* Orange Micro,	Grappler Plus (e or +)	$ 149	$ 119
	16K Buffer Board for Grappler Plus	$ 175	$ 116
	Buffered Grappler Plus, 16K	$ 239	$ 179
Paymar,	Lower Case Chip, Rev. 7 (II+)	$ 50	$ 39
* PCPI,	Applicard, 14 features 6MHz	$ 375	$ 275
RH Electronics,	Super Fan II	$ 75	$ 59
* Titan/Saturn,	Accelerator II	$ 599	$ 399
Transend/3SM,	AIOII Serial/Para I/F	$ 225	$ 199
TG Products,	Game Paddles (II+)	$ 40	$ 29
	Joystick (II+)	$ 60	$ 45
Videx,	PSIO I/F Card	$ 229	$ 188
WICO,	Mouse, Complete	$ 179	$ 118

SOFTWARE for your APPLE

BUSINESS & TRAINING

Arktronics,	Jane (IIe or IIc only)	NEW	$ 179	$ 119
	Jane (II+)	NEW	$ 295	$ 199
* Applied Soft Tech.,	VersaForm		$ 389	$ 259
Artsci,	Magic Window II		$ 150	$ 99
* Ashton-Tate,	dBase II (Req CP/M 80)		$ 495	Call
	Friday (Requires CP/M 80)		$ 295	$ 199
BPI Systems,	GLAR,AP,PR or INV,each		$ 395	$ 269
* Broderbund,	Bank St.Writer or Speller,ea		$ 70	$ 45
Business Solutions,	Jack 2 (IIe)	NEW	$ 395	$ 265
	Incredible Jack	NEW	$ 129	$ 89
Continental,	GLAR,AP or PR, each		$ 250	$ 165
*	Home Accountant		$ 75	$ 49
	Tax Advantage		$ 70	$ 47
CDEX,	on Visicalc, Multiplan or Apple IIe,ea.		$ 60	$ 40
Dow Jones,	Market Analyzer		$ 350	$ 225
	Market Manager		$ 300	$ 199
	Market Microscope		$ 700	$ 450
Fox & Geller,	Quickcode or dGraph, ea.		$ 295	$ 195
	dUtility (for dBase II)		$ 99	$ 65
Hayden,	Pie Writer (Specify 80 col. bd)		$ 150	$ 89
* Howard Soft,	Tax Preparer, 1984		$ 250	$ 185
Knoware,	Knoware	NEW	$ 95	$ 64
LJK,	Letter Perfect w/Mail Merge		$ 150	$ 99
Micro Pro,	(all require Z80-CP/M Card)			
*	WordStar w/Applicard &CP/M	SPECIAL	$ 695	$ 295
*	InfoStar w/Applicard &CP/M	SPECIAL	$ 695	$ 295
*	WordStar™ + Training Manual	SPECIAL	$ 495	$ 239
*	SpellStar™ or MailMerge™, ea.	SPECIAL	$ 250	$ 129
*	WordStar Professional, 4 Pak	SPECIAL	$ 695	$ 355
*	Options Pak, SS/MM/SI	SPECIAL	$ 345	$ 155
Microsoft,	Multi-Plan, Apple DOS or CP/M		$ 195	$ 129
* Osborne/ComX,	(Disk and Book)(Stat., Bus. & Math)			
	Some Common Basic Programs(75 ea.)		$ 100	$ 49
	Practical Basic Programs(40 ea.)		$ 100	$ 49
Peachtree,	Requires CP/M & MBasic, 64K			
	Series 40 GL & AR & AP, all 3		$ 395	$ 239
Perfect,	Perfect Writer /Spell-2 pak(CP/M)		$ 399	$ 199
* Quark,	Word Juggler & Lexucheck (IIe)		$ 189	$ 139
Sensible,	Sen. Speller or Bookends, ea.		$ 125	$ 85
Sierra/On-Line,	ScreenWriter Pro, 2 Pak		$ 200	$ 135
	ScreenWriter II		$ 130	$ 89
	The Dictionary	NEW!	$ 100	$ 69
	Gen. Manager II	NEW!	$ 230	$ 155
	Homeword		$ 50	$ 34
* Silicon Valley,	Word Handler		$ 60	$ 39
*	List Handler		$ 50	$ 33
*	Handler Pak (Word, List & Spell)		$ 130	$ 85
Software Arts,	TK!Solver (for IIe or IIc)		$ 299	$ 199
Software Publishing,	PFS: File		$ 125	$ 84
(specify + or e)	PFS: Report		$ 125	$ 84
	PFS: Graph		$ 125	$ 84
	PFS: Write (IIe)		$ 125	$ 84
Stoneware,	DB Master Version 4.0		$ 350	$ 229
	DB Utility I or II		$ 129	$ 87
Videx,	UltraPlan		$ 189	$ 119
VisiCorp,	Visicalc 3.3 (II+)		$ 250	$ 169
VisiCorp,	Visicalc Enhanced (IIe)		$ 250	$ 179
	Visifile or VisiDex, each		$ 250	$ 179

UTILITY & SYSTEM

Beagle,	GPLE or Alpha Plot, each	$ 35	$ 27
	Ap Mechanic, Dequick or Pronto DOS,ea.	$ 30	$ 19
	Double Take or Utility City, each	$ 30	$ 19
	Flex Text or Frame Up, each	$ 30	$ 16
	Typefaces, Tip Disk #1 or DOS Boss, each	$ 20	$ 15
Central Point,	Filer, DOS 3.3 & Util.	$ 20	$ 15
*	Copy II Plus (bit copier)	$ 40	$ 30
Einstein,	Compiler —Applesoft BASIC	$ 129	$ 85
Epson,	Graphics Dump	$ 15	$ 6
Hayes,	Terminal Prog (for Smartmodem)	$ 100	$ 85
* Insoft,	GraFORTH II by Paul Lutus	$ 90	$ 85
Microsoft,	A.L.O.S.	$ 125	$ 85
	Fortran 80	$ 195	$ 135
COMPLETE MICROSOFT LINE IN STOCK			
* Omega,	Locksmith (bit copier)	$ 100	$ 75
Penguin,	Complete Graphics System II	$ 80	$ 54
	Graphics Magician	$ 60	$ 41
Phoenix,	Zoom Grafix	$ 40	$ 34
Quality,	Bag of Tricks	$ 40	$ 29
Terrapin,	Logo	$ 99	$ 65
United SWI,	ASCII Express-The Pro	$ 130	$ 87
Utilico,	Essential Data Duplicator III	$ 80	$ 49

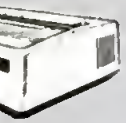
HOME & EDUCATIONAL

Atari,	Centipede, Pacman or Donkey K.,ea.	$ 35	$ 28
Berrens,	Study Program for SAT	$ 90	$ 60
Beagle Bros.,	Beagle Bag	$ 30	$ 19
Bluechip,	Millionaire	$ 60	$ 40
Broderbund,	Choplifter or Lode Runner,ea.	$ 35	$ 23
	Arcade Machine	$ 60	$ 40
	Apple Panic	$ 30	$ 20
CBS,	C. Goren Learning Bridge	$ 80	$ 54
* Continental,	Home Accountant	$ 75	$ 49
Datasoft,	Aztec or Zaxxon, each	$ 40	$ 27
Davidson,	Speed Reader II	$ 70	$ 47
	Word Attack! or Math Blaster! ea	$ 50	$ 34
Edu-Ware,	(Large Inventory)	35% off list	
Harcourt,	Computer Prep for SAT	$ 80	$ 54
Hayden,	Sargon III (Chess)	$ 50	$ 34
Invicom,	Zork I,II,III, or Starcross, each	$ 40	$ 27
* Insoft,	3 Games,Zarg /Spider Raid /Grapple	$ 82	$ 25
Knoware,	Knoware	NEW	$ 95	$ 64
Koala,	Full line in stock, CALL	35% off list	
Learning Co.,	(Large Inventory)	35% off list	
Microsoft,	Typing Tutor II	$ 25	$ 17
Monogram,	Dollars and $ense	$ 100	$ 99
Origin,	Ultima III	$ 60	$ 40
Scarborough/Lightning,	Mastertype	$ 40	$ 27
Sierra/On-Line,	Ultima II	$ 60	$ 40
Sir-Tech,	Wizardry	$ 50	$ 35
Spinnaker,	Full line in stock, CALL	35% off list	
Sub Logic,	Flight Simulator II	$ 50	$ 37
Terrapin,	Logo	$ 99	$ 65

OVERSTOCK SPECIALS

★ OKIDATA MICROLINE 80

ONE TIME, QUANTITY LIMITED



80 cps, Pin /friction feed, 80 col., 132 col compressed 96ASCII, Graphics, Parallel — $ 299 — $ 179

MISCELLANEOUS

		LIST PRICE	OUR PRICE
Electronic Protection,	Lemon	$ 60	$ 40
	Lime	$ 90	$ 60
	Peach	$ 98	$ 66
	Orange	$ 140	$ 95
Kensington,	PC Saver™ Line Cord w/filter	$ 50	$ 39
NetworX,	Wireline, 4 outlet, w/filter-surge	$ 70	$ 49

★ MEANS A BEST BUY

DISKETTES

	LIST PRICE	OUR PRICE
CONROY-LAPOINTE DISKETTES		
3 Year Limited Warranty. Top Quality product and we guarantee it with our name. Bulk packaged		
10 ea. SS/SD, 35 Track (Apple, etc.)		$ 21
100 ea. SS/SD, 35 Track (Apple, etc.)		149
1000 ea. SS/SD 35 Track (Apple, etc.)		1245
10 ea. DS/DD 40 Track (IBM, H/P)		29
100 ea. DS/DD, 40 Track (IBM, H/P)		239
1000 ea. DS/DD 40 Track (IBM, H/P)		1995
AMDEK, 3" Diskettes, Pac-10	$ 60	$ 49
CDC, 100 ea SS/DD, 40T (Apple, IBM)	$ 550	$ 195
10 ea SS/DD 40T (Apple, IBM)	$ 55	$ 21
100 ea DS/DD 40T (IBM, H/P)	$ 750	$ 295
10 ea DS/DD 40T (IBM, H/P)	$ 75	$ 32
DYSAN, 10 ea SS/DD (Apple, etc.)	$ 41	$ 29
10 ea DS/DD 48T(IBM,H/P,etc.)	$ 69	$ 43
MAXELL, 10 each, MD 1, SS/DD	$ 55	$ 29
10 each, MD 2, DS/DD	$ 75	$ 39
VERBATIM, 10 each MD525-01, SS/DD	$ 49	$ 25
10 each MD 34, DS/DD	$ 84	$ 35
GENERIK™ DISKETTES — AS LOW AS $1		
W/Jackets, no labels, top quality. 90 day limited warranty		
100 ea. SS/SD, 35 Track (Apple, Atari)	$ 415	$ 130
1000 ea. SS/SD, 35 Track (Apple, Atari)	$4150	$ 995
100 ea. DS/DD, 48TPI (IBM, H/P)	$ 626	$ 170
1000 ea. DS/DD, 48TPI (IBM, H/P)	$6260	$1400

hp	41CX, Calculator	NEW!	$ 325	$ 275
	41C, Calculator		$ 195	$ 149
	41CV Calculator w/2.2K		$ 275	$ 218

for the ATARI

	RANA 1000 Drive, 320K	$ 449	$ 369
	KOALA, Pad w/Micro Illus.	$ 100	$ 75

MODEMS AND ACCESSORIES

		LIST PRICE	OUR PRICE
ANCHOR,	Signalman Mark XII	$ 399	$ 299
HAYES,	IBM-PC Smartmodem 1200B	$ 599	$ 419
	IBM-PC Smartcom II Software	$ 149	$ 109
	Micromodem IIe w/Smartcom	$ 329	$ 239
	Micromodem 100 (S-100 bus)	$ 399	$ 275
	Stack Chronograph (RS-232)	$ 249	$ 189
	Stack Smartmodem 300(RS-232)	$ 289	$ 225
	Smartmodem 1200 (RS-232)	$ 699	$ 535
IBM-PC to Modem Cable		$ 39	$ 29
KENSINGTON,	Modem 1200 NEW	$ 595	$ 385
NOVATION,	103/212 Smart Cat	$ 595	$ 415
	ACCESS 1 2-3 (1200B +Crosstalk XVI)	$ 595	$ 399
	Apple Cat II 300 BAUD	$ 389	$ 249
	212 Apple Cat, 1200 BAUD	$ 725	$ 559
	Cat	$ 189	$ 139
	J-Cat	$ 149	$ 104
	212 Auto Cat	$ 695	$ 579
QUADRAM,	Quadmodem, Internal IBM (July)	$ 595	Call
	Quadmodem, Stand alone (July)	$ 695	Call

SOFTWARE: SEE APPLE OR IBM UTILITY SOFTWARE SECTIONS

MONITORS AND ACCESSORIES

* AMDEK,	12" Green, #300G	$ 200	$ 125
*	12" Amber, #300A	$ 210	$ 144
*	12" Amber, #310A for IBM-PC	$ 230	$ 149
*	13" Color I+, Composite	$ 379	$ 289
*	13" Color II,RGB,Hi Res, (IBM /Apple)	$ 529	$ 439
	13" Color IV, RGB, 720Hx400V (IBM)	$ 795	$ 685
	DVM III, Color II or III to Apple II I/F	$ 199	$ 175
* PRINCETON,	RGB Hi Res, HX 12	$ 795	$ 499
*	RGB Hi Res, SR 12	$ 799	Call
*	Amber, MAX 12 (for Mono Board)	$ 249	$ 199
* QUADRAM,	Quadchrome 12" RGBColor	$ 695	$ 499
*	Quadscreen 17" 968x512	$1995	$1595
ZENITH,	12" Green, ZVM123	$ 200	$ 99
	12" Amber, ZVM124	$ 200	$ 149

PLOTTERS

AMDEK,	Amplot II, 6 pen 10 x14 Bed	$1099	$ 899

PRINTERS AND ACCESSORIES

DOT MATRIX:

		LIST PRICE	OUR PRICE
EPSON,	RX80FT, 100 cps	$ 499	$ 339
	RX80, 100 cps	$ 399	$ 299
	FX80, 160 cps	$ 699	$ 499
	FX100, 160 cps	$ 895	$ 689
	MX100F/T 80cps, w/Graftrax+	$ 995	$ 499
	Apple II Graphics Dump Program	$ 15	$ 9
* MANNESMANN	Spirit, 80 col 80cps	$ 399	$ 299
TALLY,	160L, 80 col. 160cps	$ 798	$ 568
	180L,132col. 160cps	$1098	$ 779
OKIDATA,	80, 80 col. 80 cps, para. SPL	$ 299	LOW!
	82A, 80 col., 120 cps, para.	$ 349	$ 319
	83A, 132 col., 120 cps, para.	$ 749	$ 599
	84, 136 col, 200 cps, para.	$1395	$1095
	92, 80 col., 160 cps, para.	$ 599	$ 469
	93, 136 col., 160 cps, para.	$ 999	$ 749
	2350P Pacemark, 350cps,para	$2695	$2095
	2410P Pacemark, 350cps,para	$2995	$2395
	Accessories, Plug 'N Play Tractors,Okigraph		Call
ORANGE MICRO,	Grappler +, for Apple	$ 165	$ 119
PRACTICAL,	Microbuff In-Line 64K,Para.	$ 349	$ 259
	Microbuff In-Line 64K,Ser	$ 349	$ 259
QUADRAM,	Quadjet, Jet Color Printer	$ 895	$ 795
* STAR MIC.,	Gemini 10"X, 120cps	$ 499	$ 289
	Gemini 15"X, 120cps	$ 549	$ 439

LETTER QUALITY:

AMDEK,	5040, 40 cps, Para. & Ser	$1675	$1450
* TTX,	1014, 13cps,Para &Ser.,Pin&Fric.,3p	$ 649	$ 439
JUKI,	6100 18 cps, Para., 3 pitch	$ 599	$ 459

PRINTER INTERFACES and BUFFERS:

	IBM-PC Parallel Printer Cable	$ 60	$ 35
	Apple II I/F & Cable for Epson or Gemini	$ 95	$ 59
QUADRAM,			
	Microfazer, w/Copy PP 8K, #MP8 w/PS	$ 189	$ 139
	Microfazer w/Copy PP 64K, #MP64 w/PS	$ 319	$ 239
	Microfazer w/Copy PP, 128K, w/PS	$ 465	$ 345
	Microfazer, Snap-on 8K, PP, Epson or /PS	$ 179	$ 145
	Microfazer, Snap-on, 64K, PP Epson w/PS	$ 319	$ 235

All Microfazers are expandable in /copy to 512K (Snap-on to 64K)
SUPPLIES: Tractor Feed Paper, Ribbons, Daisy Wheels.

ORDERING INFORMATION AND TERMS:

MAIL TO: 12060 SW Garden Place, Portland, OR 97223—Include telephone number and double check your figures for Shipping, Insurance & Handling)

All items usually in stock. Cashiers Check= Money Orders, Fortune 1000 Checks and Government Checks, we immediately honor. Personal or other Company Checks allow 20 days to clear. No C.O.D. Prices reflect a 3% cash discount so ADD 3% to above prices for VISA, MasterCard or American Express. For U.S. Mainland, add 3% ($5 minimum) for shipping, insurance and handling ($4/HI by UPS UPS ground is standard so add 3% ($10 minimum) more for UPS Blue for $4/HI. Add 12% total ($15 minimum) for S&H for US Postal, APO or FPO. For Hawaii, Alaska and Canada, UPS is in some areas only, all others are Postal so call, write to specify Postal. Foreign orders except Canada for S&H add 18% ($25 minimum) for S&H except for monitors add 30% ($50 minimum) for S&H. All prices, availability and specifications subject to errors or change without notice so call to verify. All goods are new, include warranty and are guaranteed to work. Due to our low prices and our assurance that you will get new unused products, ALL SALES ARE FINAL. Call before returning goods for repair or replacement. Orders received with insufficient S&H charges will be refunded. ORDER DESK HOURS 6 A.M. to 6 P.M. PST Monday through Friday and 10 to 4 Saturday. 6 A.M. here is 9 A.M. in New York.

OUR REFERENCES: We have been in computers and electronics since 1958, a computer dealer since 1978 and in computer mail order since 1980. Banks: 1st Interstate Bank, (503) 643-4678. We belong to the Chamber of Commerce (503) 228-9411, and Direct Marketing Association, so call Dunn and Bradstreet if you are a subscriber.

EconoRAM™, Fastrak™ and Generik™ are trademarks of ComX Corporation. PC MasterCard™ and SoftRAM™ are trademarks of Magnum Computer

CASH & CARRY OUTLETS:

Over the counter sales only. Open Monday through Friday 10:00 until 6:00, Saturday 10:00 until 6:00

PORTLAND, OREGON—NEW LOCATION! At Park 217 Tigard at intersection of 217 and 99W. Coming from Portland on 99W take immediate left after 217 overpass and Texaco Station. Call 620-5595.

SEATTLE, WASH —3540 128th Ave. SE, Bellevue, WA 98006 1st 641 4736, in Loehmann's Plaza near Factoria Square, SE of Hwy 405 & 90 and at SE 38th & Richards

-LA POINTE SM

Formerly **Computer Exchange**

DEALERS WE BUY EXCESS INVENTORIES

LOW PRICES TO PROFESSIONALS WHO KNOW WHAT THEY WANT AND KNOW HOW TO USE IT!

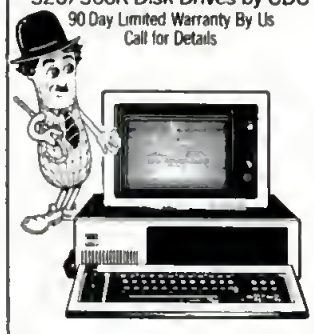
© 1984 by Conroy-LaPointe Inc. All Rights Reserved

256K IBM-PC or XT

320/360K Disk Drives by CDC

90 Day Limited Warranty By Us

Call for Details



SM 1984 Service Mark of Conroy-LaPointe Inc.

SUPPLY CENTER for IBM-PC or XT

		LIST PRICE	OUR PRICE
AMDEK	MAI 4-in 1 Multiple Board: Color Graphics &Mono, Para Port,	$ 499	$ 399
AST	ComboPlus, 64K, S/P/CC	$ 395	$ 265
	ComboPlus, 256K, S/P/CC	$ 695	$ 495
	MegaPlus II, 64K, S/P/CC	$ 445	$ 345
	MegaPlus II, 256K, S/P/CC	$ 695	$ 595
	256K MegaPlus II Expander	$ 395	$ 295
	SixPakPlus, 64K, S/P/CC +S/W	$ 395	$ 265
	SixPakPlus, 256K,S/P/CC +S/W	$ 695	$ 499
	SixPakPlus, 384K,S/P/CC +S/W	$ 695	$ 595
	Game Port for SixPak	$ 50	$ 39
	I/O Plus II, S/P/CC	$ 215	$ 150
	I/O Plus II, S/P/CC/G	$ 265	$ 185
	I/O Plus II 2S/P/CC/G	$ 315	$ 215
	MonoGraphPlus™P/CC(for Lotus)	$ 495	$ 375
	PCNet, Starter Kit, PC002		$1095
	PCNet, Circuit Board, PC001		$ 495
***CCS**	SuperVisen, 132 col., mono board	$ 799	$ 499
	Graphics Adapter for Supervisen	$ 250	$ 150
Chalkboard,	Power Pad (Requires Kit)	$ 100	$ 73
	Chalkboard Starter Kit	$ 50	$ 34
***ComX**	EconoRAM™ 256K RAM Card w/Fastrak™ RAM disk emulator and spooler software	$ 495	$ 325
CURTIS	UNI-I, Monitor tilt & swivel base	$ 50	$ 39
	3 to 9 foot keyboard cable	$ 40	$ 30
	Vertical CPU "System Stand"	$ 25	$ 19
	Monochrome Ext. Cable Pair	$ 50	$ 35
HERCULES	Colorgraphics w/para.	$ 245	$ 169
	Graphic Card, Mono	$ 499	$ 349
Key Tronic	KB5150, Std. keyboard	$ 209	$ 159
	KB5151, Std. keyboard NEW	$ 255	$ 199
	KB5151 jr. keyboard NEW	$ 255	$ 189
Koala	Koala Pad™ w/PC Design Programmer's Guide	$ 150	$ 99
		$ 15	$ 14
MAYNARD	Multifunction (6) Card, MFC	$ 89	$ 79
	Memory Card no RAM	$ 199	$ 169
SANDSTAR SERIES	Memory Card 256K	$ 499	$ 399
	HardDisk I/F Module (HDM)	$ 495	$ 395
	HardDisk Cable	$ 30	$ 27
	Para Port Module (PPM)	$ 59	$ 49
	Serial Port Module (SPM)	$ 95	$ 79
	Clock Cal. Module (CCM)	$ 55	$ 48
	Game Adapter Module (GPM)	$ 49	$ 43
	Memory Module "0"K (MMO)	$ 122	$ 99
	Memory Module 256K (MM256)	$ 422	$ 357
*	XT10 meg Hard Disk & I/F WS1	$1395	$1150
MICROSOFT	SystemCard 256K	$ 625	$ 450
	Mouse	$ 195	$ 145
MOUSE SYSTEMS	PC Mouse w/software	$ 295	$ 195
MAGNUM,	PC MasterCard™, 1.536K, Multifunction S/P/G/CC with SixRAM™ software which provides printer spooler, RAM disk & many other functions	$4995	$3950
PLANTRONICS	Color Board & Colormagic, 16 color w/Para	$ 559	$ 395
	Color Board & Draftsman, 18 color, w/Para	$ 559	$ 395
PARADISE,	ModeDisplay Card NEW	$ 595	$ 435
QUADRAM	NEWEST VERSION	$ 680	$ 480
* Quadlink			
	Quadboard, no RAM, expand to 384K	$ 295	$ 215
	Quadboard 64K, expand to 384K,S/P/CC	$ 395	$ 279
	Quadboard 256K, expand to 384K,S/P/CC	$ 575	$ 525
* Quadboard, 384K, S/P/CC		$ 795	$ 625
	Quadboard II, no RAM, expand to 256K	$ 295	$ 215
	Quadboard II, 64K,expand to 256K,2S/CC	$ 395	$ 265
	Quadboard II, 256K, 2S/CC	$ 595	$ 395
	Quad 512 + 64K plus serial port	$ 525	$ 285
	Quad 512 + 256K plus serial port	$ 550	$ 420
	Quad 512 + 512K plus serial port	$ 695	$ 625
	Quadcolor I, board, 16 colors	$ 295	$ 215
* Upgrade Quadcolor I to II kit		$ 275	$ 199
	Quadvue, board, Mono /S-/P/CC		Call
* Quadchrome, 12" RGB Color Monitor		$ 795	$ 495
	Quadscreen, 17" 968x512 Mono Monitor	$1995	$1595
SIE	Super RIO with 256K	$ 689	$ 499
	RIO Plus with 256K	$ 665	$ 499
	Graphic Plus	$ 395	$ 285
Tecmar	Graphics Master	$ 695	$ 545
	1st MATE, 64K, S/P/CC	$ 389	$ 275
	1st MATE, 256K, S/P/CC	$ 589	$ 399
	Captain, 64K,S/P/CC	$ 424	$ 324
	Captain,384K,S/P/CC	$ 796	$ 595
	Wave, 256K (short board)	$ 499	$ 369
	Bosun, S/P/CC(short brd.)	$ 195	$ 145
Titan	Accelerator PC (8086 + 128K)	$ 995	$ 750
TG PRODUCTS	Joystick	$ 45	$ 30
WICO, IBM-PC Mouse		$ 100	$ 69

Prices and availability subject to change. Call

$49 Call for Larger Quantity Prices

★ 9 Each, 64K, 200 ns, MEMORY CHIP KIT

90 Day Warranty by us

$325 $295 Two or more.

★ ComX EconoRAM™ 256K BOARD

Fully Compatible 1 Year Limited Warranty by ComX

With Fastrak™ RAM Disk Emulator and Spooler Software

Works on DOS 1.1, 2.0 or 2.1

★ MEANS A BEST BUY

for the IBM-PC or XT DRIVES AND ACCESSORIES

ALLOY

PC Backup, 16MB, Cartridge Tape Sys.	$2195	Call
PC STOR,41MB / 17MB Disk & Backup Sys.	$5995	Call

AMDEK

Amdek V, ½ height, internal, 320/360K	$ 329	$ 249
Cable, Amdek III to IBM-PC interface		Call

CONTROL DATA

320K/360K DS/DD DISK DRIVES

With Detailed Installation Instructions

30 Day Limited Warranty by Factory Authorized Distributor

Same as now installed by IBM **$185** FULL HEIGHT

CDC HALF **$165** HEIGHT

	LIST PRICE	OUR PRICE
CDC, ½ Ht Dual Drive Installation Kit	$ 30	$ 16

10 MEG (XT) DISK KITS

Convert your PC to 10 meg and to be XT compatible with one of the following INTERNAL HARD DISK SYSTEMS. Kits are quality engineered to work with DOS 2.0/2.1. Completely XT compatible. All you need is your DOS manual. Easy to install. Includes 10 Megabyte Hard Disk, Controller Card and Instructions.

ComX Internal 10 meg Hard Disk Kit	NEW	$ 869
Kamerman Labs Megalight 10Q, 10 mbyte Hard Disk Kit	NEW	$869

MAYNARD

10 meg Hard Disk Kit, WS1 Sandstar Controller will accept 3 Sandstar modules $1395 $1150

QUADRAM, Quaddisk Internal Hard Disks w/Controller

6MB Removable	NEW	$2295
6MB Fixed	NEW	$1995
12MB Fixed	NEW	$2250
27MB Fixed	NEW	$2895
72MB Fixed	NEW	$6500

TAVA-PC IBM COMPATIBLE

TAVA-PC, 256K, 2 Half Height CDC 360K Drives, Disk Controller, Color Graphics Card and

● with no Monitor	$2345	$1995
■ with Amdek Amber Monitor 310A	$2575	$2139
● with Amdek Green Monitor 300G	$2545	$2139
● with Amdek Color I+ Monitor	$2724	$2279
● with 1 floppy, 10 MB Hard Disk IBM-XT Compatible by ComX	$3995	$2795

We find the TAVA PC to be as compatible with the IBM-PC as the Compaq, Eagle and Columbia PC World (April 1984) says, "The TAVA-PC strongly resembles the IBM-PC in looks and operation."

SOFTWARE for IBM-PC or XT

BUSINESS & TRAINING

APPLIED SOFT. TECH., Versaform		$ 389	$ 265
ARKTRONICS, Jane	NEW	$ 295	$ 199
ASHTON-TATE			
Framework avail. July /Aug	9EW	$ 695	$ 465
* dBase II, (req. PC-DOS & 128K)		$ 495	Call
dBase II User's Guide (Book)		$ 30	$ 20
Everyman's DB Primer (Book)		$ 15	$ 12
Friday		$ 295	$ 199
ASK, MICRO, GL,AR,AP,INV or PR, each		$ 595	$ 295
ATI, Training Programs —Wide line in stock		$ 75	$ 50
* **BRODERBUND,** Bank Street Writer		$ 60	$ 56
BPI, Gen'l Acctg,AR,AP or PR, each		$ 595	$ 395
BUSINESS SOLUTIONS, Jack 2	NEW	$ 495	$ 335
CDEX, Training for (Large inventory)		$ 70	$ 47
CHANG LABS, Micro Plan		$ 495	$ 335
* **CONTINENTAL,** 1st Advantage		$ 70	$ 45
Home Accountant Plus		$ 150	$ 89
FCM (Filing, Cataloging, Mailing)		$ 125	$ 79
Property Management		$ 495	$ 329
DOW JONES, Market Analyzer		$ 350	$ 225
Market Manager		$ 300	$ 195
Market Microscope		$ 700	$ 450
FOX & GELLER, Quickcode, dGraph, Grafox or Qz, each		$ 295	$ 195
dUTIL (MSDOS or CP/M-86, each)		$ 99	$ 65
HAYDEN, IBM Pie Writer		$ 200	$ 135
Pie Speller or Sargon III,each		$ 50	$ 34
HOWARDSOFT, Tax Preparer 1984 for 1983 year		$ 295	$ 220
HUMAN EDGE, Management or Sales, ea.		$ 250	$ 199
IUS, Easy Writer II System		$ 350	$ 259
Easy Speller II		$ 100	$ 68
Business System GL+AR+AP GL,AR,AP,OE or INV, each		$1495	$ 995
* **INSOFT,** Data Design (easy to use DBMS)		$ 595	$ 395
GraFORTH (animated 3D graphics)		$ 250	$ 125
KNOWARE, Knoware (reg. graphics)	NEW	$ 125	$ 99
LIFETREE, Volkswriter 1.2	NEW	$ 95	$ 64
Volkswriter Deluxe		$ 195	$ 130
* **LOTUS,** 1-2-3		$ 295	$ 195
Symphony, (avail July /Aug)	NEW	$ 495	$ 309
1-2-3 to Symphony (avail July /Aug)	NEW	$ 695	$ 465
QUE, Using 1-2-3 (Book)	NEW	$ 200	$ 135
MICROPRO, WordStar®	SPECIAL	$ 15	$ 12
MailMerge™	SPECIAL	$ 495	$ 239
CorrectStar™	SPECIAL	$ 250	$ 129
* WordStar Professional, 4 Pak	SPECIAL	$ 345	$ 125
ProOptions, SS/MM /SI	SPECIAL	$ 695	$ 355
StarIndex™	SPECIAL	$ 345	$ 155
InfoStar™	SPECIAL	$ 195	$ 109
* **MICRORIM,** Rbase, Series 4000	SPECIAL	$ 495	$ 259
Extended Report Writer	NEW	$ 495	$ 299
		$ 150	$ 99

BUSINESS & TRAINING

MICROSOFT, Multiplan (MSDOS)		$ 195	$ 129
Word(PCDOS)		$ 375	$ 259
Word with Mouse (PCDOS)		$ 475	$ 325
Financial Statement		$ 100	$ 69
Budget		$ 150	$ 99
MONOGRAM, Dollars & Sense		$ 165	$ 110
MULTIMATE, Multimate		$ 495	$ 295
OPEN SYS, GL,AR,AP,PR,INV or PO,each		$ 695	$ 429
* **OSBORNE/COMX,** Book & Business, Statistics & Math Programs on DS/DD Disks)			
Some Common Basic Programs(70 ea.)		$ 100	$ 69
Practical Basic Programs (40 each)		$ 100	$ 69
PDI, Personal Investor 1.1		$ 145	$ 99
PEACHTREE, Peach Pak (GL,AR&AP)		$ 395	$ 239
Peach Text 5000		$ 395	$ 239
* **PERFECT,** Perfect Writer™		$ 349	$ 219
Writer & Speller, 2 Pak		$ 399	$ 249
Perfect Filer™ or Perfect Calc, each		$ 249	$ 149
Perfect Writer, Speller Filer Calc (4)		$ 699	$ 499
SOFTWARE ARTS, TK! Solver		$ 399	$ 299
SOFTWARE PUBLISHING, PFS:File		$ 140	$ 94
PFS:Report		$ 125	$ 84
PFS:Write		$ 140	$ 95
PFS:Graph		$ 140	$ 95
SORCIM, SuperCalc 2		$ 295	$ 195
SuperCalc 3		$ 395	$ 265
SSI /SATELLITE, WordPerfect		$ 495	$ 275
Personal WordPerfect		$ 195	$ 149
STC /SOFTEC, The Creator		$ 300	$ 199
STONEWARE, Advanced D.B. Master		$ 595	$ 395
SYNAPSE, File Manager		$ 100	$ 67
SYNERGISTIC, Data Reporter		$ 250	$ 169
T/MAKER, T/Maker III		$ 275	$ 169
THOUGHTWARE, Mgt. Series		33% off	list
VISICORP, VisiCalc 4		$ 250	$ 169
VisiFile, VisiSchedule or Desktop Plan I		$ 300	$ 199
VisiWord with VisiSpell (128K)	SPECIAL	$ 375	$ 265
Visi on Calc (XT Only)		$ 395	$ 265

UTILITY & SYSTEM

1983 CL SOFTWARE AWARD:

"Copy II PC by Central Point Software is still one of the best software buys of available. It will copy more copy protected software and faster than any other backup system. Unlike other copiers it makes an exact duplicate of your original and it does 100% verification of copy. Documentation is excellent."

* **CENTRAL POINT,** Copy II PC Backup	$ 40	$ 30
* **COMX,** Fastrak™ RAM /Disk emulator and printer spooler program. Works on any PC /DOS version or RAMCard. Menu Driven	$ 100	$ 59

UTILITY & SYSTEM

DIGITAL RESEARCH,		
Concurrent CP/M 86™ w/windows	$ 350	$ 225
CP/M 86™ (PC/XT)	$ 60	$ 40
CBASIC 86™ (CP/M86)	$ 200	$ 135
CBASIC Compiler (CP/M 86 or PCDOS,ea)	$ 600	$ 365
Pascal/MT+ (CP/M 86)	$ 400	$ 269
Pascal/MT+ (PCDOS)	$ 600	$ 399
PL/1 (PCDOS or CP/M 86, each)	$ 750	$ 499
Access Mngr (PCDOS or CP/M 86,each)	$ 400	$ 269
Display Mngr (PCDOS or CP/M 86,each)	$ 500	$ 339
Speed Prog. Pkg. (CP/M 86)	$ 200	$ 135
CIS COBOL (CP/M86)	$ 850	$ 525
DR LOGO 86 (CP/M86)	$ 100	$ 99
HAYES, Smartcom II (Data Com.)	$ 119	$ 99
* **INSOFT,** GraFORTH (animated 3D graph)	$ 125	$ 95
MICROSTUF, Crosstalk XVI (Data Com.)	$ 195	$ 129
MICROSOFT, muMath /muSimp	$ 300	$ 199
Business BASIC Comp	$ 600	$ 399
Pascal Compiler	$ 300	$ 199
C Compiler	$ 500	$ 329
BASIC Compiler	$ 395	$ 269
FORTRAN Compiler	$ 350	$ 250
COBOL Compiler	$ 700	$ 469
NORTON, Utilities 2.0, 14 programs	$ 80	$ 54
ROSESOFT, Prokey	$ 130	$ 97

HOME & EDUCATIONAL

ATARI, Centipede, PacMan or Donkey each	$ 35	$ 28
EPYX/Auto Sim., Temple of Apshai	$ 40	$ 29
* **ARMONK,** Executive Suite	$ 40	$ 27
BLUE CHIP, Millionaire or Tycoon,each	$ 60	$ 39
BPI SYSTEMS, Personal Accounting	$ 99	$ 66
* **BRODERBUND,** Apple Panic (Color)	$ 30	$ 19
Lode Runner or Serpentine, each	$ 35	$ 23
CBS, Chas. Goren Learn Bridge NEW	$ 80	$ 54
COMPREHEN., PC Tutor (1 or 2 0 ea)	$ 60	$ 40
CONTINENTAL, Home Accountant Plus	$ 150	$ 89
DAVIDSON, The Speed Reader II	$ 75	$ 49
Word Attack! or Mathblaster, each	$ 50	$ 34
INFOCOM, Deadline or Suspended, each	$ 50	$ 33
Zork I or Zork II or Zork III, each	$ 40	$ 27
* **INSOFT,** Mystna Wardina or Quintus,each	$ 35	$ 25
MICROSOFT, Flight Simulator	$ 50	$ 33
MONOGRAM, Dollars & Sense	$ 165	$ 110
ORIGIN, Ultima III	$ 60	$ 40
PBL CORP., Personal Investor	$ 145	$ 99
SCARBOROUGH/LIGHTNING, MasterType	$ 50	$ 34
SOFTWORD SYSTEMS Multimate	$ 495	$ 295
SPINNAKER, Snooper Troops (1 or 2)	$ 45	$ 35
Story Machine or Face Maker	$ 35	$ 24
STRATEGIC, The Warp Factor	$ 40	$ 30
9UBLOGIC, Night Mission Pinball	$ 40	$ 27

OUR AO #P7

MEMBER DIRECT MARKETING ASSOCIATION

VISA MasterCard Card master charge

NO SALES TAX

NATIONAL ORDER DESK **TOLL FREE (800) 547-1289**

Order Desk Hours: 6AM to 6PM PST

Oregon TOLL FREE (800) 451-5151 Portland 620-9077	Hot Line For Information On Your Order (503) 620-9078

FREE GIFT

Use of our order forms qualifies you for a free gift with your order. Get on our mailing list now for order forms, and our new newsletter and sales specials announcement. Our customers are already on our list.

OUR AD #P7 **COUPON**

MAIL TO: 12060 SW Garden Place, Portland, OR 97223

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

CIRCLE 126 ON READER SERVICE CARD

SOFTWARE

Alpha Software
Data Base Manager II . $ 179
Typefaces 79

American Internat'l Communications
Tlx-A-Syst . $ 199
Gram-A-Syst 199

Advanced Analytics Technology
the "Banner . $ 22

Ashton-Tate
IBM/PC Reference Encyclopedia . $ 55

ATI
All Training Programs . $ 60

Autodesk
Autocad . $ Call

d-BASE II CORNER

Anderson-Bell
Abstat . $ 289

Ashton-Tate
d-Base II . $ Call
d-Base III . $ Call
FPL . $ 410
Friday 179

Better Business Solutians, Inc.
d-Base II (writes checks) . $ 75

Data Based Solutians
dNAMES . $ 95

Fox & Geller
dGraph . $ 215
Quick Code 175
D Util 62

Global Technologies
dbLINK . $ 69

Human Soft
d-Base Plus . $ 90

Sensible Designs
D-Programmer . $ 199

Software Banc
d-Base II User's Guide . $ 20
Advanced d-Base II User's Guide . $ 27
Report Writing w/ purchase of dBase II . $ 10

Tylog Systems
d-Base Window . $ 179

*All above available on PC-DOS

B&L
Multi-jab (Runs nine programs at once) . $ 145

BPI
Personal Accounting . $ 139

Best Programs
PC Fixed Asset System . $ Call

Cdex
All Training Progs . ea $ 52

Central Point
Copy II PC . $ 34

Campuview
Vedit CP/M 86 . $ 130
Vedit 130
Systran . $ 99

Cantinental Software
The Home Accountant . $ 89
Small Business Acct 155
PC Combo Pak (Tax Advntg/Home Acc't) . $ 169

Decision Resources
Chartmaster . $ 289

Digital Research
Concurrent CP/M 86 . $ 225
CP/M-86 49
Pascal MT+ 86 CP/M (w/SPP) . $ 375
Pascal MT+ (PC DOS) . 385
C Basic 86 135
C Language/compiler . 260
DR Graph 245
DR Logo 99
Personal Basic 86 115
PL/1-86 499
Others . $ Call

Dow Jones
Market Analyzer . $ 245
Market Manager 219
Spreadsheet Link 199
Investment Evaluator 95

Eco-Soft
Microstat . $ 259

Emerging Technolagies
Edix (editor) . $ 139
Wardix (formatter) 139
Both 269

Enertronics
Energraphics . $ 265

Fastware
Thor (the thought organizer) . $ 245

Financier Inc.
Financier II . $ 119
Tax Series 105

Fox & Geller
Grafox . $ 199
R-Graph (for R-base 4000) . $ 215

Harvard Associates
PC Logo . $ 129

Harvard Software
Project Mgr. . $ 299

Hayes
Smartcom II . $ 89

LOTUS 1-2-3

CONSUMER SOFTWARE, INC.
'Auditor' (proofing tool) . $ 85

LIGHTHOUSE SOFTWARE
Key II (Data Management for 1-2-3) . $ 149

SOFTCORP, INC.
PRO-JECT 6-250 . $ 159
PRO-JECT 6-150 125
PRO-JECT 6-75 75
(A complete Critical Path Project Management System. Not 1-2-3 specific.)

STRATEGIC SOFTWARE SYSTEMS, INC.
Bottomline V . $ 195

TRILLIUM COMPUTER
Visuall . $ 79
Lotus Shell for Visuall 39

Heritage
Smartkey II . $ 75

Information Unlimited
Easywriter II System . $ Call
Easy Speller . $ Call
Easy Filer . $ Call
Accounting Module . $ 350

Individual Software
Instructar . $ 35
Prof. DOS 47
Prof. Pixel 47
Tutorial Set 75

Innovative Software
T.I M. IV . $ 275
Fast Graphs 229

Living Videotext
Think Tank (256K) . $ 139

MDBS, Inc.
Knowledge Man . $ 329

Micro Pro
WordStar . $ 265
Infostor 265
Starburst 149
Pak (WS, MM, SI, CS) . $ Call

Micro Rim
Report Writer . $ 119
R Base 299
R Base Clout . $ Call

Microsoft
MuMath/MuSimp . $ 179
Pascal Comp (DOS) 229
Project 199
C Compiler (DOS) 309
Basic Compiler (DOS) 249
Multiplan MS/DOS 149
Ward 229
Word w/Mouse 299
Others . $ Call

Microstuf
Crosstalk . $ 109

Morgan Computing
Professional Basic . $ 299
Trace 86 99

PCjr.
Please call us regarding products for the IBM PCjr.

Mosaic/Graphic Software
Super Chartman II . $ 299
Chartman IV 199
Bath II and IV 350
Integrated 6 369

Narth American
Answer (Database Prog.) . $ 159
Memory Shift 79

Northwest Analytical
Stat Pak . $ 365

Satellite Software
Word Perfect w/ Sp. . $ 299
Others . $ Call

Saftcroft
Fancy Fants . $ 150

Software Arts
TK! Solver . $ 279
Applic Pkg for TK . $ 79

Software Publishing
PFS: Report . $ 79
PFS: File, Graph, Write 89
PFS: Access 79

Softword/ Multimate Systems Inc.
Multimate (WP) . $ 289

Sorcim
Supercalc III . $ 249
Super Writer 199

Star Saftware
Legal Timekeeping, Billing & Accts . $ 787
Accounting Partner 289

Supersoft
Fortran IV PC/DOS or 8086 . $ 279
8087 Support 40
Others . $ Call

Systems Plus
Landlord (prop mgmt) . $ 375

Visicarp
VisiCalc . $ 165
VisiOn . $ Call

PEACHTREE CORNER

- PeachText 5000 Personal Productivity System. Includes: PeachText Word Processor, Random House Electronic Thesaurus, Spelling Proofreader, PeachCalc Electronic Spreadsheet and List Mgr **All of the above for only** . $ 249
- PeachPak 4 (General Ledger, Accounts Receivable, Accounts Payable) does not support hard disk . $ 249
- Series B Accounting Mod (each) $ Call
- All other Peachtree Products . $ Call

Nartan-Lambert
Lync . $ 129

Oasis
The Word Plus . $ 110
Punc & Style 99

Open Systems
Acctg Fitness Program . $ 449

PC Software
PC Crayon . $ 36
Create-a-base 60

Peter Norton
Utilities . $ 55

PBL Corp.
The Personal Investor . $ 129

Rosesaft
ProKey 3.0 . $ 99

SPI
Open Access . $ 399

Wang/Aspen
Grammatik . $ 60
Proofreader 42

Woolf Software Systems
Move It (PC to CP/M and PC to PC) . $ 89

... and many more.

GAMES

Automated Stimulation, Armonk, Avalon Hill, Blue Chip, Braderbund, Data Most, Infocom, On Line, Spinnaker Software, Sierra/On-Line, Sublogic, Weekly Reader . $ Call

CIRCLE 351 ON READER SERVICE CARD

BOARDS

AST Research
Six Pak Plus 64K (Ser, Par, Clk, exp to 384K) .. $ 269
MegaPlus 64K (CI/Cal, Ser Port, 512K capacity w/Megapak) ..... $ 269
Monograph Plus ..... $ Call
PC Net II Bus Syst ..... $ Call
CC-232 cord ..... $ Call
Extra ports for Megaplus and I/O Plus II Game, Par & Ser ..... $ 40
Megapak 256K expansion ..... $ 325
I/O Plus II (CI/Cal, Ser Port) ..... $ Call

DISPLAY CARDS CORNER

Amdek MAI Card .$ 420
Fredericks/Plantronics Colorplus .. $ Call
Hercules Graphics Board .. $ 359
Quadram
Quadcolor I ..... $ 199
Quadcolor II 389
Quadcolor II (upgrade) ..... $ 210
Tecmar Graphic Master ... $ 499
USI Display Card (clr/monochrome) .. $ 399

Maynard Electronics
Floppy Dr Controller ... $ 169
w/Par Port 219
w/Serial Port 229
Sandstor Floppy Dr Controller ..... $ 199
Sandstor Memory Card -3 modules cap (0K) $ 145
Sandstar Multifunction Card-6 modules cap $ 79
Sandstar Modules ..... $ Call

Quadram
Quadboard 64K (Exp 384K CI/Cal, Ser & Par Ports, Software) .. $ 269
Quadboard 384 (0K) ... $ 239
Microfazer Stack Printer Buffer (exp to 512K)
▶ Par/Par 8K (exp 512K) $ 139
▶ Ser/Par 8K (exp 64K only) ..... $ 149
▶ Ser/Ser 8K (exp 64K only) ..... $ 149

Quadram (Cont'd)
Quadlink 64K Mem allows Apple 5/W to run on IBM/PC ..... $ 469
All Others ..... $ Call

PC NETWORKING

The "Orchid Blossom" (to 384K, Clk w/ alarm, S&P ports, ram disk and disk caching, upgradeable to PCNet ....$ Call
Santa Clara Starter Kit ..... $ 1,245
X Comp
X Net (2 bds - 2 users) ..... $ 829
X Net Exp Brd .. ea $ 429
Add'l Networking Products ..... $ Call

Rainbow Technologies
OK Writer Module (for Okidata 83A, 82A) $ 99
Tecmar Products ... $ Call

Xedex/Micralog
Baby Blue ..... $ 325
Baby Blue II 525

MONITORS

Amdek Video 300A Amber ..... $ 149
Amdek Color II + ... $ 429
NEC JB1201 - 12" Gr ... $ Call
NEC JB1260 - 12" Gr ... 119
NEC JC1216 RGB 429
Panasonic ..... $ Call
PGS
HX12 RGB Clr ..... $ 499
MAX 12 220
SR12 (690 × 480 Res) ... 639
Quadram
Quadchrome ..... $ 495
Sanyo B112-12HR Gr .. $ Call

SONY

Profeel 12" ..... $ Call
Profeel 19" ..... $ Call
Profeel 25" ..... $ Call

Taxan
KG12N-UY 12" HR Am $ 139
KG12N 12" HR Gr 132
RGB Vision-1 12" LR Clr ... . $ 323
RGB Vision-3 12" HR Clr ..... $ 459
USI 1200A 12" HR Am .$ 159

MODEMS

Hayes
Smartmodem 300 ..... $ Call
Smartmodem 1200 499
Smartmodem 1200B (Int) 439
Chronograph 189
Microcom, Inc.
Era 2 (1200 internal baud) ..... $ 395
Novation ..... $ Call
US Robotics
Auto-Dial ..... $ 459
Password 325
5-100 339

DISK DRIVES

CDC 1800 ..... $ 229
Corona HD ... . $ Call
Corvus HD ..... $ Call
Davong
10/15/20MB HD ..... $ Call
Santa Clara HD ..... $ Call
Tandon TM-100-2 ..... $ 209
Vista
Dynalrome Systems w/ 5 to 40 MB Primary Disk Drive ..... $ Call

XEBEC

9710 10MB Hard Disk including host adapter (Personality) and software to work on IBM/PC $1,599

HALF HIGHS
Matsushita ..... $ 199
Panasonic 199
Shugart 225
Teac w/brackets 210

PRINTERS

Diablo 630 ECS ..... $ Call
Diablo 630 API ..... $ Call
Epson ..... $ Call
Mannesmann Tally
MT 180L ..... $ 810
MT 160L 569
Spirit ..... $ 315
420L ..... $ Call
440L $2,399
NEC 3550 ..... $1,650
Okidata 82-93 ..... $ Call
Quadram Quadjet ...$ Call
Siemens
Ink Jet Printers PT88 ... $ 749
Star Micronics ..... $ Call
Teletex T1014 ..... $ 469
Transtar
T-130-P/S ..... $ 665
T-315P Dot Matrix 489
T-120P/S 475

... and much more.

AUGUST SPECIALS!

Juki Industries of America, Inc.

6100 - Prints graphics, 2K buffer, (exp to 8K), bidir, tractor feed option, proportional spacing, 11" print line, uses 100-char drop-in daisy wheel and IBM Selectric II® ribbon... $449

Printek, Inc.

920 S/P - 340 cps multi-function, 80 cps letter quality, 260 lines per minute, 136 col., 1-4 copies w/ friction & pinfeed standard, 144 × 144 dots/inch graphics, Bell & Howell third party service .. $2,099

DISKETTES

3M 5" DS DD Box .... $ 40
CDC ..... $ 26
Maxell 5" DS DD MD2 Box ..... $ 40
Spectrum 5¼" DS, DD (box/10) .. $ 29
Verbatim 5" DS DD Box ..... $ 35
(3 Boxes Diskettes Minimum)

PLOTTERS

Amdek
DXY-100 ..... $ 599
Amplot II ..... $ 899
Enter P100 Sweet P .... $ 545
Enter Six Shooter ..... $ Call
Houston Instruments . $ Call
Panasonic Digital Plotter VP6801P $1,375

MISC.

Alpha-Delta MACC surge protector ..... $ 55
Flip 'n' File 5¼" ..... $ 22
Houppage
8087 Math Pkg w/ software ..... $ 255
87 Chip 159
Others ..... $ Call
Key Tronic
5150 ..... $ 175
KB5151 ..... $ 219
KB5151 Dvorak ..... $ 219
5152 (same as 5151 but with voice recognition ..... $ Call
Kraft Joystick ..... $ 45
Microsoft Mouse ..... $ 155
Mouse Systems
PC Mouse ..... $ 229
SGL Homalite
Optech CRT filters ..... $ Call
Street Electronics
Echo Speech Synth for IBM ..... $ 179
Systems Management Assoc.
PC Documate (comprehensive reference aids) $ Call
TG Joystick ..... $ 49
Thunderware
Thunderclock ..... $ 126
Versa Computing
Versawriter ..... $ 239

SDI, Inc.
STOPLOCK

Completely **STOPS** computer in boot mode — *LOCKS IT UP INTERNALLY* **OPENS** only to valid user with I.D. code (Check money-back guarantee by SDI, Inc.) ..... $ Call

A variety of complete PC compatible systems are available at Oryx. For assistance in determining your needs, use our technical line.* We will be happy to provide full support.

Columbio — Corona
Hyperion — Televideo

Policy:

- Wisconsin residents add 5% for sales tax.
- Minimum $4.00 for shipping, handling and insurance for orders to $200.
- For orders over $200, add 2½% for shipping, handling and insurance.
- ½% discount for cash payments.
- Foreign — add 15% handling & shipping for prepayment. (Int'l money order.)
- Prices are subject to change without notice.
- All items subject to availability.

We Welcome:

- Visa, MasterCharge and American Express. (No charge for credit cards.)
- Corporate, government and educational accounts. (For additional discounting, please ask for special accounts desk.)
- COD (Add $2.00 per shipment. Cash or certified check required.)
- Checks. (Allow 1-2 weeks for clearing.)

Working Hours:

Monday-Friday 8:30-6:00
Saturday 10:00-2:00
Central Time

ORYX SYSTEMS, INC.
CRAFTSMEN OF THE NEW TECHNOLOGY
425 First Street • P.O. Box 1961
Wausau, Wisconsin 54401

***For technical assistance, order status and in Wisconsin:**
715-848-1374

Int'l Telex: 260181
ORYX SYS WAU

ORDER TOLL FREE OUTSIDE WISCONSIN 1-800-826-1589

CIRCLE 363 ON READER SERVICE CARD FOR AUGUST SPECIALS

You'll be sorry

if you buy an IBM® PC multifunction or graphics board before August 17.

PARADISE

SYSTEMS, INC

IBM is a registered trademark of International Business Machines Corporation Inc

CIRCLE 484 ON READER SERVICE CARD

HIGH TECHNOLOGY AT AFFORDABLE PRICES

Dot Matrix Printers

C. Itoh Prowriter (B51D)	$ 369.88
C. Itoh Prowriter-2, (136 col)	589.88
C. Itoh Prowriter BPI	439.88
C. Itoh HotDot	509.88
C. Itoh HotDot-2 (136 col)	729.88
Epson RX/FX/LQ Series	CALL
Inforunner Ritemen	309.88
Mennesmann Tally Spirit-80	329.88
Okidata Microline 92	469.88
92 w/IBM graphics compatibility	469.88
Okidata Microline 93	699.88
93 w/IBM graphics compatibility	699.88
Okidata Microline 64 Step II	889.88
NEC P2 Pinwriter	749.88
NEC P3 Pinwriter (1BD cps, 136 col, w/IBM-PC interface)	$1039.88
Star Micronics Gemini 10X	299.88
Star Micronics Gemini 15X	429.88
Star Micronics Delta 1D	369.88
Star Micronics Delta 15	559.88
Ster Micronics Redix 1D/15	CALL
Toshiba P-1351	1689.88

Letter-Quality Printers

C. Itoh A-10 Starwriter (1B cps)	$ 549.88
C. Itoh F-1D Starwriter (4D cps)	1079.88
C. Itoh F-10 Printmaster (55 cps)	1379.88
Diablo Printer Series	CALL
NEC 2D1D/2030 (18 cps)	749.88
NEC 2050 for IBM-PC (18 cps)	899.88
NEC 3530 (33 cps)	1429.88
NEC 3550 for IBM-PC (33 cps)	1779.88
NEC 7730 (5D cps)	1939.88
Qume Sprint 11/4D/55	CALL
Qume LetterPro 20	709.88
Silver Reed EXP-77D (25 cps)	979.88
Silver Reed EXP-55D (17 cps)	559.88
Silver Reed EXP-500 (12 cps)	439.88
Silver Reed EXP-400 (10 cps)	329.88
SCM Memory Correct III (12 cps)	589.88
Star Micronics PowerType (1B cps)	CALL

Modems

Hayes Smartmodem 300	239.88
Hayes Smartmodem 1200	559.88
Hayes Smartmodem 1200B	479.88
Novetion SmartCet 103, 300bd	169.88
Novetion SmartCet 212, 1200bd	409.88
Novation Access 1-2-3	409.88
USR Password, 1200 baud	369.88
USR Password, 3DD baud	159.88
Volksmodem, 300 baud (IBM-PC)	69.88
9-wire Modem Cable (1-8 & 20)	29.88
Multi-Line Junction Box	29.88

Monitors

Amdek 300G (green)	$ 144.86
Amdek 3DDA (amber)	159.88
Amdek 310A (TTL amber)	179.88
NEC JB-12D5M (amber/green)	159.88
Princeton Graphics HX-12 (690H x 24DV RGB Monitor w/cable)	509.88
Princeton Graphics Max-12 (Amber Monochrome/TTL w/cable)	199.88
Quedrem QuedChrome (690H x 240V RGB Monitor w/cable)	529.88
Roland DG-121 (green/amber)	149.88
Roland DG-122 (green or ember monochrome/TTL w/cable)	179.88

IBM-PC Peripherals

64K Memory (4164/200ns) 9/pkg	$ 79.88
Alloy 41 MB Disk/Tape System	$CALL
Alloy PC Backup System	CALL
AST 64K MegaPlus II	289.88
AST 256K MegaPlus II	479.88
AST Megaplus II optional Parallel port, 2nd RS-232C port or Geme Port	39.88
AST 256K MegePak	CALL
AST SixPak Plus 64K	299.88
AST SixPak Plus 256K	519.88
AST SixPek Plus 384K	639.88
Columbia Computer Systems	CALL
Hercules Graphics Card	379.88
Keytronics 5151 keyboard	CALL
Microsoft Mouse (parallel)	149.88
Mouse Systems PC-Mouse	219.88
Peradise MultiDisplay	479.88
NEW Quedram 384K Quadboards	CALL
Quedrem Quad 512 + (64K)	239.88
Quadram Quad 512 + (512K)	689.88
Quedram Memory Boerds	CALL
Quadram QuadColor-1	219.88
Quedrem QuadColor-2	229.88
Quedram QuadVue (monochrome)	CALL
Quadram QuadDisk	CALL
Quedram Parallel Card, RS-232C Card or Clock/Celendar Cerd	79.88
Quadram QuadLink	509.88
Quadram QuadLink (Columbia)	539.88
Quadram QuadLink (Compaq)	539.88
Tandon TM 100-2 DSDD	229.88
Titan Cygnus I/O (clock/parallel)	149.88
Titan Cygnus I/Q (clock/RS-232)	169.88
Titan MultiFunction Board	CALL
TG Joystick	59.88

Accessories

Printer Cables	$29.88
BD Column Printer Stand (metal)	39.88
132 Column Printer Stand (metel)	49.88
2-Way Printer Switch Box	109.88
4-Way Printer Switch Box	159.88
DSDD Diskettes	CALL
Curtis Monitor Stand w/cables	119.88
Curtis Monitor Stand w/o cables	64.88
Tilt/Swivel Monitor Stand	39.88
Curtis System Stend	24.88
EPD Lemon/Lime/Orange/Peach	CALL
Flip-n-File Disk Boxes	CALL
Kensington PC-Saver	45.88
Kensington Micro-Saver	59.88
Quadram Microfazer Print Buffers	CALL
Trace Sound Trap (BD col)	129.88
Trace Sound Trap (132 col)	189.88

ADVANCED LOGIC SYSTEMS • ALLOY • AMDEK • ANADEX • AST • CCS • CARDCO • C ITOH • COMREX • COLUMBIA DATA PRODUCTS
CURTIS MANUFACTURING • DATA PRODUCTS (IDS) • DIABLO • DTC • EAGLE COMPUTER • EASIFEED • EPD • EPSON • FRANKLIN COMPUTER
HAYES MICROCOMPUTER PRODUCTS • HERCULES COMPUTER TECHNOLOGY • INFORUNNER • INTERACTIVE STRUCTURES • JMM
JUKI • KENSINGTON MICROWARE • LEADING EDGE • LQ • MANNESMAN TALLY • MA SYSTEMS • MICROSOFT • MILFORD NULL MODEM
MOUSE SYSTEMS • NOVATION • NEC • OKIDATA • ORANGE MICRO • PARADISE SYSTEMS • PERFECT DATA • PRINCETON GRAPHICS
QUADRAM • QUME • QCS • RANA SYSTEMS • ROLAND DG • SILVER REED • SMITH-CORONA • STAR MICRONICS • TANDON • TECMAR
TITAN • TOSHIBA • USI • US ROBOTICS • VIDEX

The right place for the right price

If you live in the New England aree (or plen to visit there), you should drop by our ***DISCOUNT COMPUTER SHOWROOM***. We're about one hour's drive from Boston, the ocean or the White Mountains. From Boston, just go up Route 3 to Nashua, NH, and take Exit 7W (Route 101A). We're 5.1 miles from that exit, in Amherst NH. Take the next right after you see the Dexter Shoe factory outlet store.

In fact, we're near a lot of New Hampshire's factory outlet stores, and with no sales tax you can save a bundle on computer equipment, shoes and whatever else strikes your fancy. We have several systems on display, as well as printers, modems end monitors, all at the same prices you see in our ads. And if you can't fit a purchase into your car, don't worry...we'll ship it free anywhere in the 48 contiguous states.

No matter where you live—Boston or San Francisco—You don't have to strike out into the wildemess to save money. Take a short drive or drop us a line for the best advice and price on IBM-PC peripherals and IBM-PC compatible computers.

SHOWROOM HOURS: 10-6, Mon-Fri, 10-5 Staurdays

TECHNICAL SALES DESK

(603) 881-9855

TOLL-FREE ORDER DESK

(800) 343-0726

Houra: 9:00 to 5:30 EST, Mon-Fri

- FREE UPS ground shipping on all orders over $50 (under $50 add $2.50 for handling)
- Shipments fully insured at no extra charge
- MaaterCerd, VISA, American Express, Oiners Club & Carte Blanche credit cards accepted
- No aurcharges on credit card
- Credit cards are not charged untii your order is shipped from our warehouse
- COOs accepted up to $1000 (add $10 for COD handling). Payabla with cartified check, money order or cash.
- Full manufacturer's warranty on all products sold
- 1-year extended warranty service is now available for many products (just ask us)
- Sorry no APO/FPO or foreign orders

AMERICAN EXPRESS

HIGH TECHNOLOGY AT AFFORDABLE PRICES

THE BOTTOM LINE

MasterCard VISA

MILFORD, NH 03055-0423 □ TELEPHONE (603) 881-9855

CIRCLE 213 ON READER SERVICE CARD

THE FILE CONNECTION

8" DISKETTE SYSTEM FOR THE IBM PC

Our "FILE CONNECTION" programs provide 8" diskette file exchange between the IBM PC and most Micro-Mini-Main Frame computer systems.

Our "WORD CONNECTION" programs provide 8" diskette text document exchange between the IBM PC and many word processing systems.

Our "DISPLAYWRITER CONNECTION" programs transform documents from Textpack, Wordstar, Multimate, etc. to the new DisplayWrite 2 format.

In addition to our hardware and program products, we also provide a conversion service for customer supplied diskettes. Please contact us for information about the hundreds of 5¼" and 8" diskette formats and systems which we currently support.

FLAGSTAFF ENGINEERING / 2820 West Darleen / Flagstaff, AZ 86001
Telephone 602-774-5188 / Telex 705609 FLAG-ENG-UD

CIRCLE 133 ON READER SERVICE CARD

THANKS TO COMPUSERVE'S CB SIMULATOR, "DIGITAL FOX" ACCESSED "DATA HARI" AND PROCEEDED TO AN "ALTARED" STATE.

The CB Simulator, where CompuServe Subscribers can Access Friends and Influence People on 72 Different Channels.

Just pick your handle and get on line. From math to matrimony, there's always someone out there who speaks your language. Friends from all over the U.S. and Canada are at it 24 hours a day. Talking tech or just having fun. And if you've got a secret, just use the CB Scrambler. That'll fool the "lurkers," those CB "see it alls" who get their kicks by watching. Or you can always use the private talk mode for guaranteed one-to-one conversation.

The CB Simulator is just one of CompuServe's many electronic communications options that include a National Bulletin Board, Professional Forums and Electronic Mail. Plus, there's a world of on-line information and entertainment all for the price of a local phone call plus connect time.

You can access CompuServe with almost any computer and modem, terminal or communicating word processor.

To receive your illustrated guide to the CompuServe Information Service and learn how to subscribe, call or contact:

CompuServe

Consumer Information Service P.O. Box 20212
5000 Arlington Centre Blvd. Columbus, OH 43220

800-848-8199

In Ohio call 614-457-0802

An H&R Block Company

CIRCLE 226 ON READER SERVICE CARD

"My computer keeps track of 135,000 cubic feet of wholesale auto parts."

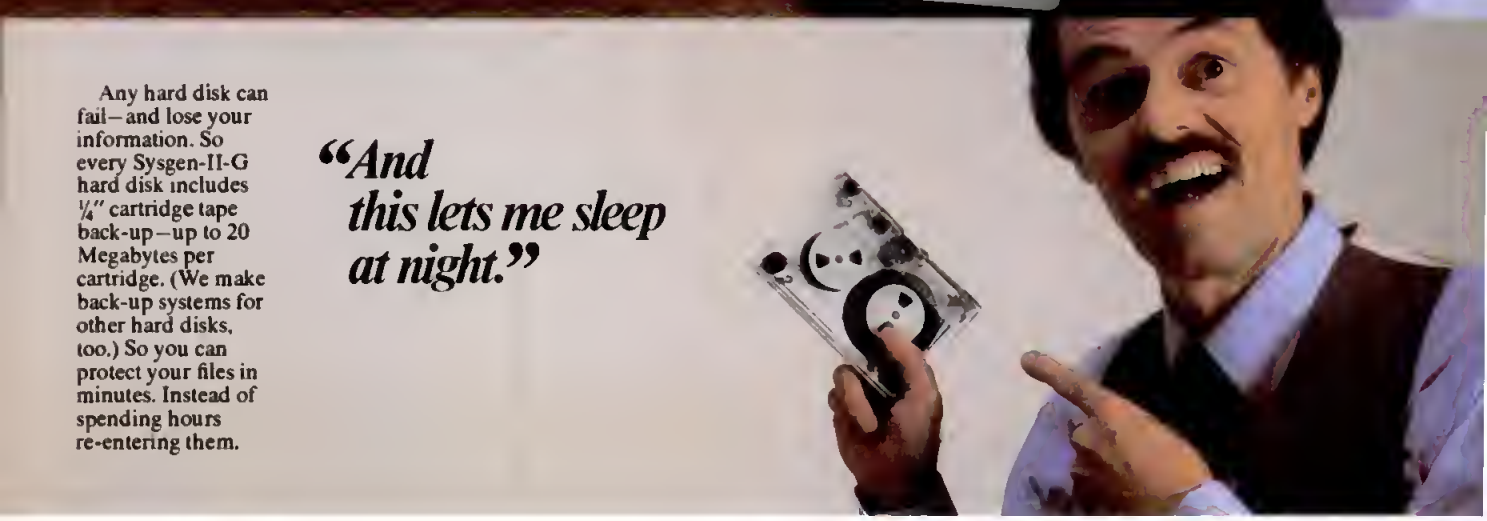
The more work you do, the more you need to store. And the harder it is to work with stacks of floppy diskettes.

"My Sysgen hard disk stores the whole lot and runs a whole lot faster."

Sysgen-II-G™ hard disk systems store everything—up to 20 Megabytes—conveniently. You can look at any program or file in seconds. But . . .

"And this lets me sleep at night."

Any hard disk can fail—and lose your information. So every Sysgen-II-G hard disk includes ¼" cartridge tape back-up—up to 20 Megabytes per cartridge. (We make back-up systems for other hard disks, too.) So you can protect your files in minutes. Instead of spending hours re-entering them.



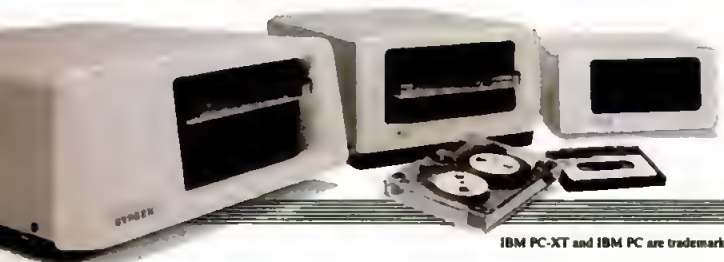
Sysgen. Because a hard disk without tape just doesn't make sense.

CIRCLE 474 ON READER SERVICE CARD

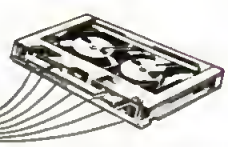
Sysgen products for the IBM® PC, PC XT™, and other personal computers: Economical, 10- and 20-Megabyte hard disk systems with tape back-up. Or 10-Megabyte tape back-up for the IBM PC XT.

Go to your local computer dealer. Ask for a demonstration of Sysgen back-up systems. And find out how to make sense of your storage.

47853 Warm Springs Blvd., Fremont, CA 94539
(415) 490-6770 Telex 4990843



SYSGEN
INCORPORATED



IBM PC-XT and IBM PC are trademarks of International Business Machines Corporation SYSGEN-II-G and IMAGE are trademarks of Sysgen, Incorporated.

New-Product Love

Shall I compare thee to a summer's day? Or to a software package? A sweet season of new product introductions has begun, and many of you may be falling in love yet again.

John Donne, a metaphysical poet of the Elizabethan era, chronicled the sweet foibles of romantic love. One of his more famous poems, "A Lecture upon the Shadow," compares the progress of a love affair to the progress of the sun through the sky. Many of his observations could be profitably applied to the genesis and introduction of a new hardware or software product.

. . . These three hours that we have spent,
Walking here, two shadows went
Along with us, which we ourselves produc'd.

Building a reputation for a new product is a slow and deliberate process. But clouds and shadows surround a product's entry into the market. Some of these shadows take the form of doubts and misinformation emanating from the rumor mill. Others stem from misinterpretation of the facts by media and industry pundits.

So whilst our infant loves did grow,
Disguises did, and shadowes, flow,
From us and our cares;. . . .

How does it start? The first inkling that a product will be introduced comes from the rumor mill. Suppliers are a good source for the future plans of hardware manufacturers. Consultants are an erratic, if informative, source for the direction of new software products.

The biggest leaks, however, come from the companies themselves. What

Bill Machrone

makes them talk? Pride is a big motivator, as is competition. Sometimes it's a casual comment. Other times, a controlled leak. No matter how the publicity begins, it's the start of a courtship.

The manufacturer courts dealers, distributors, the press, and potential customers. It is courted, in turn, by the pursued, eager as they are for information that will help them plan for purchasing decisions, promotions, coverage, and competition.

For products about which it isn't in the manufacturer's interest to plant leaks, security and secrecy are phenomenal. IBM's PC*jr* is a perfect case in point. Almost no one predicted its configuration correctly.

The software publishers have done a credible job of keeping their mouths shut, too. Ashton-Tate managed to keep the wraps on *dBASE III* for 22 months.

That love hath not attained the highest degree,
Which is still diligent lest others see.

Sooner or later, though, comes the fateful product introduction day. The drag racing crowd has an old adage: "When the flag drops, the bullshit stops." While there's a certain poetry in that earthy phrase, Donne said it better:

But, now the Sunne is just above our head,
We do those shadowes tread;
And to brave clearness all things are reduc'd.

The new product is now exposed for all the world to see. Will it meet with accolades or derision? Warm acceptance or cool disdain? *Brave* is the right word for the manufacturer. You can't be so sure of a product's design, timing, and positioning that you can face an introduction with anything but trepidation. *(continued)*

Pick up a SixPakPlus™

Introducing...SixPakPlus™, the refreshing new 384KB multifunction card! In response to the changing needs of the IBM PC and PC-XT marketplace, AST Research, Inc. is proud to announce the latest addition to our line of multi-function enhancement products, the **SixPakPlus**! This new product is the result of extensive marketing research into the needs of IBM PC users whether they have the original 64K system board, the newer 256K system board, or the PC-XT. The **SixPakPlus** has been engineered to meet these needs at a competitive price while maintaining AST's high standards for quality and reliability.

The **SixPak**, as we like to call it, could have been named for the six banks of RAM on it. However, we like to think that it was named for the six functions of the card.

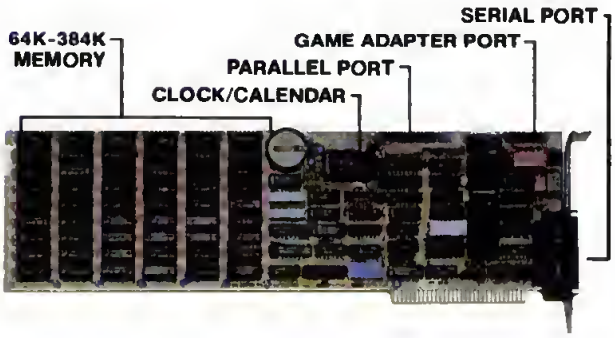
for your IBM® PC.

The features of the **SixPak** include:

1. RAM memory starting at 64K, user-expandable in 64K increments to 384K. This makes the **SixPak** ideal for the PC or PC-XT with a 256K system board; 384K on a **SixPak** added to 256K on the system board yields 640K, the maximum addressable user memory in these systems.

2. One Serial (async) communications port, configurable as either COM1 or COM2, for use with serial printers, modems, a "mouse," and other serial devices. The serial port has on-board jumpers for easy management of the RS-232C lines, simplifying the wiring of cables in many installations.

3. One Parallel (printer) port, configurable as LPT1 or LPT2 (LPT2 or LPT3 when the IBM monochrome card is installed), for use with the IBM/Epson and other compatible printers. The port is compatible with IBM diagnostics.



® IBM is the registered trademark of International Business Machines

4. A Clock-Calendar with battery backup, featuring an easily replaceable Lithium battery and a quartz-controlled timebase for a high degree of accuracy.

5. An optional IBM-compatible Game Adapter port, for use with an IBM-type joystick. In conjunction with application programming, this game port may be used for cursor control, in generating graphics or for playing games at the end of your work day!

6. Every **SixPak** comes with an AST SuperPak utility diskette which includes SuperDrive and SuperSpool, the most powerful disk emulator and print spooler software you can get. These programs will greatly enhance the throughput of your PC or PC-XT by emulating disk drive and printer access at RAM speeds rather than the normal slower speed of mechanical devices. SuperPak is the first of such software to be compatible with both DOS 1.1 and DOS 2.0.

Most important of all, the **SixPak** comes with the AST "Plus," AST's unsurpassed reputation for quality, reliability, after-the-sale support, and overall design excellence that gives our products the best price/performance ratio in the industry! Hence the name, **SixPakPlus**!

AST products are available from Computerland, Entre', ComputerMart and selected dealers worldwide. Call factory if your dealer does not have the AST products you want.

AST RESEARCH INC.

2121 Alton Avenue
Irvine, California 92714
(714) 863-1333 • TLX 753699 ASTR UR
Dealer Inquiries Welcome

CIRCLE 101 ON READER SERVICE CARD

Once a product is that far down the road, there's no turning back. Product introductions involve careful orchestration that takes months of planning, creating advertising, and choosing markets and media. It's not much different, really, from choosing the right time and place for your first date.

The die is then cast. All that planning and forethought can't create love. It can't make a match. Only the combined acceptance of the professional user base and distribution channels can make a marriage.

Unlike most relationships, however, this one is mostly one-sided. The customer can be rabidly loyal or fiendishly fickle. Most manufacturers have to work constantly to remain the apple of the consumer's eye:

Except our loves at this noone stay,
We shall new shadowes make the other way.

So it goes—users have whirlwind romances with the *VisiCalc*s and *Context MBA*s, but in time discard them for the *SuperCalc*s and *1-2-3*s. These products will one day be supplanted by—who knows?

Sometimes, though, a product is like the girl next door. You grow up with her, have fights, date other girls, fall in love, break up, swear you'll never see her again, then marry her. She may not be the prettiest or the smartest, but she's the one—your *WordStar*, your *dBASE II*, your love. You've got a relationship, a trust; it would take something cataclysmic to destroy that relationship.

Or would it? Could anyone have predicted VisiCorp's current predicament? Prevented it?

"I don't know what's wrong with me lately, hon. I guess I'm just on edge, that's all."

Sure. And you're cruising the new-product shelves at the local computer store.

The morning shadowes weare away,
But these grow longer all the day,
But oh, love's day is short, if love decay.

Love is a growing, or full constant light;
And his first minute, after noone, is night. ■

NOBODY BEATS THE SOFTMAN!

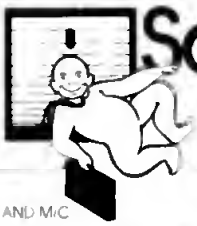
WordStar $235
WordStar Pro Pak $349
SuperCalc III $199
EasyWriter II System $189
(w/speller/mailer)
EasyWriter I System $125
(w/speller/mailer)
R: base $279

OUR PRICES ARE THE LOWEST!

SPREADS/FINANCIAL		WORD PROCESSORS	
Latus 1-2-3	$319	Ward	$239
VisiCalc IV	$169	Ward w/mause	$289
SuperCalc III	$199	Multimate	$275
EasyPlanner	$125	WordStar Pro	$349
MultiPlan	$155	EasyWriter II Syst	$189
DATA BASES		**ACCOUNTING**	
dBase II	$269	**IUS**	
Condor 3	$357	G/L, A/P, A/R, I/C, O/E ea	$289
EasyFiler	$192	**MBSI**	
R:Base	$279	G/L, A/P, A/R, O/E w/IC, Payroll	$375
QuickCode	$175	Sales Analysis	$199

OTHER TITLES AVAILABLE

WE SPECIALIZE IN VOLUME DISCOUNTS



SoftMan

ORDERS ONLY
1-800-821-6023

WE ACCEPT VISA AND M/C

For Information And In California (415) 332-5515

CIRCLE 453 ON READER SERVICE CARD

When Lotus wanted better graphics for 1-2-3, they chose a better graphics card–HERCULES.

And then we became a standard.

When the IBM® PC was introduced over 2 years ago, the talented people at Lotus realized that it was limited by a lack of high resolution graphics. They knew that this was going to have an adverse effect on 1-2-3's graphics. And Lotus didn't want anything to hold back their revolutionary software.

So they turned to Hercules.

Lotus recognized that the Hercules Graphics Card delivered the performance they wanted. It offered high quality text and high resolution graphics on IBM's monochrome display. It completely replaced the IBM monochrome card. And it didn't cost an arm and a leg.

Since then, Hercules has sold a lot of Graphics Cards. So many that the Hercules Graphics Card has become the high resolution standard for the IBM PC. And this means that there is more high resolution graphics software available for Hercules than for any other graphics card you can buy.

Software like Microsoft® Word. Our high resolution makes Word's text much sharper and easier on your eyes. And there are other programs for business graphics, computer aided design, terminal emulation and programming.

Call for our free information kit. See why the company that made the first graphics card for the IBM PC still makes the best.

Hercules. We're strong on graphics.
800 255 5550 Ext. 400

Address: Hercules, 2550 Ninth St, Berkeley, CA 94710 Ph: 415 540-6000 Telex: 754063 **Features:** IBM monochrome display graphics resolution of 720×348; parallel printer port; text mode software compatibility; free software for programming; 2 year warranty. **Foreign distributors:** Compuserve/Canada; Reflex/U.K.; Computer 2000/W. Germany; Edisoft/France; SourceWare/Australia. Trademarks/Owners: Hercules/Hercules Computer Technology; Microsoft/Microsoft Corp; IBM/International Business Machines; Lotus & 1-2-3/Lotus Development.

WHAT'S YOUR BEEF?

Do you have to spend too much time getting through all kinds of peripheral matters before you can get into your applications? Do you have to spend too much time on training and retraining of personnel? We plan to eliminate or at least mitigate those and some of your other "BEEFS"!

We're here to tell you about SYSTEMATE: WHEN YOU GET SYSTEMATE, you will have fewer "BEEFS" because you can get RIGHT into YOUR APPLICATIONS without having to spend so much time figuring out how to make the computer do what you want it to do? And you won't have to remember what to do the next time, because SysteMate does that for you.

We call it SysteMate, because that is what it does—it mates your software and hardware together into an INTEGRATED SYSTEM. The system virtually eliminates the need to know and understand PC-DOS. It will help ORGANIZE your systems and procedures. It is amazingly easy to install and operate. There are extensive context and training support HELP facilities. It provides extensive user definable MENU INSTALLATION functions. It has an unlimited MULTIPLE MENU capability, which means that there is NO LIMIT to the number or type of software you can interface with SysteMate. All PC-DOS software programs, utilities and commands are ONLY A KEY STROKE AWAY!

SysteMate enables Lotus and WordStar, and/or any other combination of applications, to ACCESS COMMON DATA FILES.

IF YOU WANT TO:

- Get right into your applications without having to spend a lot of time getting through all kinds of peripheral start-up procedures
- Eliminate unnecessary time spent on training and retraining your staff about subjects that have nothing to do with your applications
- Organize your computer activities in a systematic way
- Use the computer to increase productivity and profits

SYSTEMATE IS YOUR ANSWER!

SysteMate features: UNLIMITED NUMBER OF NESTED MENUS, DISKETTE LABELING, LABEL CHECKING BEFORE MOUNTING, DEFINABLE SCREEN PROMPTS FOR TRAINING AND EASE OF USE, ONE KEY STROKE ACCESS TO SOFTWARE, to name a few.

- SYSTEMATE IS AVAILABLE FOR ANY PC-DOS SYSTEM COLOR OR MONOCHROME.
- SYSTEMATE IS IDEAL FOR ANY HARD DISK USER.
- AND IF YOU ARE A DISKETTE USER, AND THINK SYSTEMATE IS PRIMARILY FOR HARD DISK USERS, WAIT UNTIL YOU SEE WHAT IT CAN DO FOR YOU !

SysteMate is now being used by hundreds of major corporations and thousands of individual users!

47.00
Suggested Retail Price

SysteMate, Inc.

TWIN TOWERS EAST
MARKETING SUITE 200
1106 CLAYTON LANE
AUSTIN, TEXAS 78723-1033
(512) 458-6202

ORDER TOLL FREE "24 HOURS/DAY"

1-800-824-7888-OPERATOR 806
In Alaska/Hawaii 1-800-824-7919
(MC, VISA, OR C.O.D.)

DEALER/DISTRIBUTOR INQUIRIES WELCOME

LOTUS™ and Symphony™ are trademarks of Lotus Development Corp
Wordstar® is a trademark of MicroPro International Corp

dBaseII® and Framework™ are trademarks of Ashton-Tate
Multiplan™ is a trademark of Microsoft

SysteMate™ is a trademark of SysteMate, Incorporated

CIRCLE 461 ON READER SERVICE CARD

A Satisfying Way To Deal with Bugs

Trying to convince a software manufacturer to fix a buggy program is a troublesome process. First you must convince the company's customer support rep that a bug actually exists.

Sooner or later you're going to run into a bug. Your new integrated spreadsheet program or powerful word processor just won't work the way the manual says it should. Well, what are you going to do about it? You have three options.

You can live with the bug. For example, if your word processor won't print your text in bold, one solution is simply not to print any bold text. This is the easiest way to deal with bugs, but probably the least satisfying.

You can find a way to work around the bug. For example, your word processor might provide three or four different alternatives for printing text in bold. If the bug affects only one of the alternatives, you can use the others.

Finally, you can get the software company to fix the bug—the most satisfying option. If you call the manufacturer, you will probably talk to a polite, patient customer support representative. As soon as you mention that you may have found a bug, however, the rep may start to doubt your sanity.

Why are reps automatically doubtful about the existence of a bug? Hundreds of calls will come in each day, the vast majority from first-time users of the software who are simply making some kind of operating error. This flood of calls quickly conditions the reps to be skeptical.

If you want to win the respect and cooperation of the rep, you must be prepared to prove you're not ignorant. You must establish your credibility by having your facts and solid proof at hand.

Steve Sall

Avoiding Embarrassment

To avoid embarrassment and high telephone bills, you should be absolutely certain you've found a bug before you call the manufacturer. Before you allow yourself to be convinced, take two important steps.

Be sure you've followed the manufacturer's instructions to the letter. If you're trying to find your way through the software intuitively, and you fall on your face, reach for the manual—not the telephone.

Next, try to make the problem recur. This is important for three reasons. First, it allows you to verify that you perceived the problem correctly. Second, repeatability is necessary to isolate the causes of the bug. And third, few reps will try to fix a bug that they cannot witness.

If you're still sure you've found a bug, contact the manufacturer. If you convince the rep that you've come across an honest-to-goodness problem, you'll probably be asked to mail in your disk with instructions for repeating the bug.

It's useful to write a short report providing background information about your computer, add-ons, and additional software running at the same time. Then briefly state the problem and provide specific, numbered instructions for repeating it.

All this seems like a considerable task, but it is definitely worth the effort. By proving the existence of a bug, you help keep software manufacturers on their toes. If we accept sloppy software, manufacturers will be more than happy to keep selling it to us. ■

Steve Sall is vice-president of technical publications for Multisoft Corporation in Beaverton, Oregon.

Perfect Compatibility

IBM & ACP

When you need competitive prices, prompt service and complete support, call us.

HARDWARE SPECIALS

CONTROL DATA
Full Size 320K DS/DD .....$ 225*
"The drive IBM trusted with its logo"

TEAC
Half-Height 320K DS/DD .....$ 195
"The #1 Rated Half-Height Drive"

AST MEAGAPLUS II w/256K ....$ 434

64K RAM Chips 200ns Pre-Tested $ 55

AST SIXPACK w/384K.....$ 569

MAYNARD ELECTRONICS
10MB HARD DISK
(XT Lookalike) .....$ 995

SOFTWARE SPECIALS

LOTUS 1-2-3/WORDSTAR
PROPACK .....$ 699

LOTUS 1-2-3/HERCULES
GRAPHICS CARD .....$ 679

MULTIMATE w/80K Word Speller .$ 295
An advanced word processor with all the features of a dedicated stand alone system.

dBASE II/QUICKCODE.....$ 549

EASYWRITER II/EASYSPELLER
/EASYMAILER.....$ 195

MICROSOFT WORD w/MOUSE .....$ 325

4-POINT GRAPHICS .....$ 119

HARDWARE

COMPUTER SYSTEMS

IBM
PC w/256K 2 DS/DD Disk Drives .....$ Call

TAVA
PC w/128K 2 DS/DD Disk Drives .....$ Call
2 Parallel & 1 Serial Ports
Monochrome Monitor & Board

COMMUNICATION PRODUCTS

HAYES
Smartmodem 300 .....$ 209
Smartmodem 1200 .....$ 489
Smartmodem 1200B w/Smartcom II ..$ 419
Smartmodem-to-IBM 6 ft. Cable .....$ 25
Smartcom II .....$ 99

TAC
Irma (Emulates 3278 Terminal) .....$ Call
Irma Line (For Remote Emulation) ...$ Call

We carry a wide variety of Mainframe Communication and Local Area Networks. For advice about which will suit your needs best give us a call and let us review them with you.

FLOPPY & HARD DISK DRIVES

CONTROL DATA
Full Size 320K DS/DD .....$ 225
Half-Height 320K DS/DD w/Bracket ...$ 195

DAVONG
5 MB to 32 MB Hard Disk Int./Ext. ...$ Call
(Includes power supply, controller & software)

TALLGRASS
12—70 MB Hard Disk w/Tape Backup..$ Call

TEAC
Half-Height 320K DS/DD w/Bracket ...$ 195
Half-Height 640K DS/DD w/Bracket ...$ 265

MAYNARD ELECTRONICS
10MB Hard Disk WS-1 (XT Lookalike)..$ 995
10MB Hard Disk WS-2 (XT Lookalike)..$1195

DISKETTES

SCOTCH 3M
SS/DD Box of 10 .....$ 30
DS/DD Box of 10 .....$ 35

DISK CONTROLLERS

MAYNARD ELECTRONICS
Standard Disk Controller .....$ 169
with Parallel Port .....$ 209
with Serial Port.....$ 229
Sandstar Modular Disk Controller ....$ 209
All Sandstar Modular Dptions Avail. ..$ Call

EXPANSION BOARDS

MAYNARD ELECTRONICS
Modular Memory Board w/64K to 576K.....$ 219
Modular Multifunction Board .....$ 95

- **Next Day Shipping**
- **No Credit Card Surcharge**
- **Company P.O. Accepted**

We have built our reputation on offering quality products, prompt service and effective solutions. We understand your need for well-informed people who will work with you to meet your goals. Therefore we have daveloped a unique approach to sales. Our salespeople are well educated in the computer field and will speak with you not as salespeople, but rather as consultants. They will review your options and suggest alternatives to help you construct a system to best suit both your immediate and future neede. We also have a skilled technical staff that will guide you through any problems you may encounter after receiving your equipment.

HARDWARE CONT.

AST RESEARCH
(All AST boards include SuperDrive, SuperSpool and 1 year warranty)
SixPack Plus w/64K to 384K ..... $ 269
MegaPlus II w/64K to 512K ..... $ 269
Memory Board II w/64K to 384K ..... $ 239
I/O Plus II ..... $ 139
MegaPack w/128K or w/256K ..... $ Call
PARALLEL, SERIAL, GAME DPTIONS .. $ 35

ORCHID TECHNDLOGY
Blossom w/64K to 384K ..... $ 269

TECMAR
Captain w/64K to 384K w/Software ... $ Call

OUADRAM
Quadboard w/64K to 384K ..... $ 289

PRINTERS & PLOTTERS

C. ITOH
Starwriter Letter Quality 40 cps $1195
Printmaster Letter Quality 55 cps .... $ Call
Cut Sheet Feeder (Feeds 200 sheets) .. $ 445

EPSDN
(All Printers Include GRAPHTRAX-Plus)
RX-80 (120 cps, 80 cols) ..... $ Call
RX-80 F/T (120 cps, 80 cols) ..... $ Call
RX-100 F/T (100 cps, 132 cols) ..... $ Call
FX-80 F/T (160 cps, 80 cols) ..... $ Call
FX-100 F/T (160 cps, 132 cols) ..... $ Call
Epson-IBM Cable ..... $ 30

HEWLETT PACKARD
HP—7470A Two Pen Plotter ..... $ Call
HP—7475 Six Pen Plotter ..... $ Call
HP-IBM Cable (works w/Lotus 1-2-3) .. $ 50

NEC
NEC 3550 Letter Quality 35 cps $1699
NEC 2050 Letter Quality 18 cps ..... $ 950
Bi-Directional Tractor ..... $ 235
Cut Sheet Feeder (Feeds 200 Sheets) .. $ 445
NEC-IBM Cable ..... $ 30

OKIDATA
Microline 83A (120 cps, 132 cols) .... $ 575
Microline 92 (160 cps, 80 cols) ..... $ 445
Microline 93 (160 cps, 132 cols) ..... $ 749
Microline 84 (200 cps, 132 cols) ..... $ 990
Plug n' Play ..... $ Call
Okidata-IBM Cable ..... $ 30

MDNITORS

AMDEK
Video 300 Green Screen ..... $ 300
Video 300A Amber Screen ..... $ 145
Video 310A IBM Monochrome in Amber ..... $ 170

PRINCETON GRAPHICS
HX-12 RGB Hi Resolution Color ..... $ 499
Max-12 IBM Monochrome in Amber .. $ Call
SR-12 Hi Resolution Color ..... $ Call

OUADRAM
Quadchrome Hi Resolution Color .... $ 519

VIDEO—MONITOR BOARDS

HERCULES	Graphics Card	$ 359
PC COMPONENTS	Bi-Graphix I	$ Call
PARADISE SYSTEMS	Multidisplay	$ 399
PC+ PRODUCTS	Colorplus	$ 419
STB	Graphix Plus	$ 399
OUADRAM	Quadcolor I	$ 199
TECMAR	Graphics Master	$ 499

MISCELLANEOUS

FTG—Light Pen ..... $ Call

KEY TRDNIC
Typewriter Keyboard (KB 5150) ..... $ Call
Deluxe Keyboard (KB 5151) ..... $ Call
KOALA—Touch Tablet w/Software .... $ Call
KRAFT—Joystick ..... $ 49
MICROSOFT—Mouse w/Software .... $ 159
MOUSE SYSTEMS—PC Mouse ..... $ Call
T.G.—Joystick ..... $ 49

SOFTWARE

ALPHA
Database Manager II ..... $ 199
Apple—IBM Connection ..... $ Call

ASHTON TATE
dBase II ..... $ 385
Friday ..... $ 179
Framework ..... $ Call

BEST PROGRAMS
PC/Professional Finance Program II .. $ 179

CENTRAL POINT SOFTWARE
Copy II PC ..... $ 35

DIGITAL RESEARCH
CPM/86 ..... $ Call
Concurrent CPM/86 ..... $ Call

FOX & GELLER
Quickcode ..... $ 169
dGraph (Requires Graphics Card) ... $ Call
dUtil (Utilities For dBase II) ..... $ Call

OZ
FINANCIER—Financier II ..... $ 119
FUNK—Sideways ..... $ 49
HAYES—Smartcom II ..... $ 99
IMSI—4 Point Graphics (Rated #1) .. $ 119

INDIVIDUAL SOFTWARE
Tutorial Set (IBM PC/XT and DOS) .... $ 49

INFORMATION UNLIMITED SOFTWARE
EasyWriter II System (See Specials) $ 195
Accounts Receivable ..... $ 299
Accounts Payable ..... $ 299
General Ledger ..... $ 299
Payroll ..... $ 369

INFOCDM—Zork I, II, III ..... $ 29

LATTICE
C-Compiler ..... $ 299
C-Food Smorgasboard ..... $ 110

LIFETREE
Volkswriter ..... $ 115
Volkswriter Deluxe w/TextMerge ..... $ 179

LIGHTNING SOFTWARE
Master Type (Best Typing Tutor) ..... $ 39

LOTUS DEVELOPMENT
Lotus 1-2-3 (Version 1A) ..... $ Call
Symphony ..... $ Call

MICRO DATA BASE SYSTEMS
Knowledgeman ..... $ 350

MICRDSDFT
C-Compiler ..... $ 349
Flight Simulator ..... $ 35
Multiplan (New Version) ..... $ 149
Multi-Tool Word ..... $ 275
Multi-Tool Word w/Mouse ..... $ 325
Pascal Compiler ..... $ 250

MICROPRO
Wordstar w/Tutorial on Disk ..... $ 259
Wordstar/MailMerge/CorrectStar/ StarIndex (ProPack) ..... $ 369

MICRORIM
R.base 4000 ..... $ 299
Clout ..... $ Call

MICROSTUF
Crosstalk XVI (for Hayes Smartmodem) ..... $ 109

MORGAN COMPUTING
Trace 86 (Assembly Language Debug) $ 99
Ted (Program Editor) ..... $ 79

PETER NORTON
Norton Utilities ..... $ 55

RDSESOFT
Prokey (Newest Version) ..... $ 95

SOFTWARE ARTS
TK!Solver ..... $ 299

SOFTWARE PRODUCTS
Dpen Access ..... $ 399

SATELLITE SOFTWARE INTERNATIONAL
Word Perfect (includes Speller) ..... $ 299
P. Edit (Program Editor) ..... $ 95

SDFTWARE PUBLISHING
PFS/File ..... $ 95
PFS/Graph ..... $ 95
PFS/Write ..... $ 95
PFS/Report ..... $ 79

SDFTWORD SYSTEMS
Multimate (See Specials) ..... $ 295

WANG PUBLICATION
Random House Proof Reader 50K speller ..... $ 45

APPLIED COMPUTER PRODUCTS INC.

1916 Welsh Road #6, Philadelphia, PA 19115

215-934-6990

1-800-223-3860

Our Policy

• We accept VISA, Mastercard, Money Orders, Certified Checks, Cashiers Checks, Personal Checks, Wired Funds. • We do not charge your card until we ship. • **No surcharge added on VISA and Mastercard** • Allow one week for personal and company checks to clear • COD maximum $500 Cash or Certified check on delivery • Please use local phone number for order status inquiries. • Prices subject to change without notice • Returns may be subject to restocking fee.

SHIPPING (U.S.). For monitors, printers, and hard disk drives add 2% to all orders. Blue label and Next Day Air available. For all other items add $4 **Most orders shipped next day.**

CIRCLE 120 ON READER SERVICE CARD

Organize, Protect, and Gain Space

make computing feel good

NEW!

GAIN SPACE

UNDER CARRIAGE KEYBOARD DRAWER
Model #620 **$54.00**
• Turn existing furniture into ergonomic workstations! • Sliding cantilever drawer (putty color) suspends under desk top, locks in open position • Three keyboard height selections • Fits a work space 3¼" (h) x 21" (w) x 15" (d)
Model #620B (black color)

VERTICAL CPU STAND
Model #660 **$49.00**
• Positions CPU vertically alongside desk • Adjusts to hold CPUs 3¼" to 6¼" wide • Clear anodized solid aluminum stand
OPTIONAL IBM Mono Monitor/Power Ext Cables, 4 ft —Model #670 — $49.00
Keyboard Ext Cable 6 ft — Model #680 — $29.00

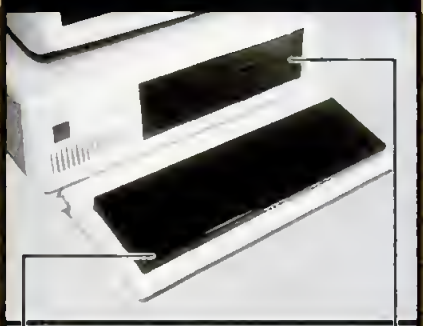
ORGANIZE & PROTECT

ROLLTOP 100 DISK FILE™
Model #100 **$36.00**
Twice the capacity (100 - 5-1/4" Disks) of the leading "flip top" file But it takes no more desk space! An outstanding design that combines contemporary styling with the elegance of a rolltop enclosure and a textured buff plastic body It includes 10 diskette dividers and anti-skid feet
Locking Model #100L - $46.00

GAIN SPACE

KEYBOARD STORAGE DRAWER
Model #610 **$89.00**
This is the perfect solution to narrow credenzas or typewriter return locations The keyboard drawer rolls smoothly on industrial strength ball bearing slides The drawer locks open for stability and has a built-in wrist rest pad The 20 gauge metal frame has a baked enamel grey finish with the drawer in putty to match the IBM PC color scheme Holds any keyboard 2-3/4" (h) x 19-3/4" (w) x 9-1/2" (d)
$5.00 Shipping/Handling*

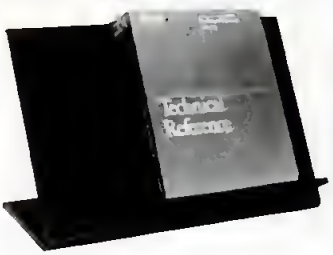
PROTECT



DISK DRIVE COVER
Model #310 **$9.00**
A cover to protect the IBM PC disk drive area from dust and dirt Molded in black plastic to match the IBM styling A vinyl foam seal prevents harmful elements from entering the disk drive area

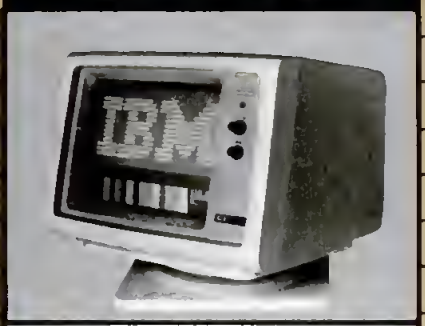
KEYBOARD COVER
Model #210 **$10.95**
Protect your computer keyboard with our dustcover made from rigid smoked bronze plastic A low silhouette design that fits keyboards such as the IBM PC and the Keytronics keyboard

ORGANIZE



EASY-VUE EASEL
Model #410 **$20.00**
The ultimate design in a manual easel Provides ideal viewing angle Protective pads prevent skidding 10" x 15" in size, it even properly displays an 8-1/2" x 11" three ring binder An elegant accessory in smoked bronze, molded from tough durable acrylic

INCREASE COMFORT



TILT 'N TURN™
Model #900 **$40.00**
LARGE CRT stand fits any CRT with feet separation up to 12" x 12" such as the IBM COLOR or Monochrome Monitor The Tilt n Turn reduces glare and eye strain, and eliminates neck craning It is made of attractive molded plastic and steel A compression spring allows completely stable 25° tilt and 360° turn without removing the CRT

Now available at ComputerLand, Businessland, Softwaire Centres, and at all leading computer and software retailers. Ask your local dealer for our products or order direct from us today.

Most orders shipped UPS within 48 hours. Add $3.00 Shipping/Handling.* Mastercard or Visa accepted, or send a check or money order to:

MicroComputer Accessories, Inc.
5721 BUCKINGHAM PARKWAY
CULVER CITY • CALIFORNIA 90230
TELEPHONE (213) 641-1800

Letters to PC

Degree of Vendor Support

During the past year I have been following your reviews of C compilers and found the articles to be valuable when it came time to choose one for myself. They covered the technical merits of the compilers and it was on the basis of technical merit that I chose the Lattice C compiler.

However, I soon discovered that there is another aspect to choosing software: the degree of vendor support. As an experienced programmer, I felt that I required only a little support . . . I didn't expect little to be none!

Lifeboat Associates, the Lattice C distributor, has not responded to three letters I have written, including the one I enclosed with my registration. In my last letter, I requested details on their update policy so that I could obtain the latest version.

Compared to Lifeboat Associates, MicroPro has been far more responsive. My dealings with MicroPro have always been quick and satisfactory. They even provided me with a free update to Version 3.3 to correct a bug in 3.24.

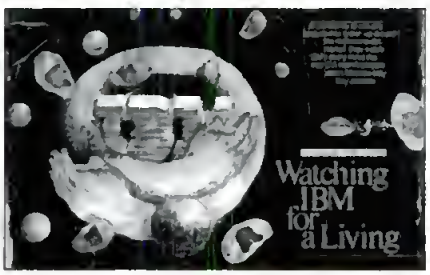
I'd like to suggest that you devote a section of your software reviews to discussing vendor support. This might include a discussion of update policies, registered user services, responsiveness to user inquiries, and other areas of user support.

Frank Bell
Birmingham, Michigan

Rule #1 with our reviewers is "call the manufacturer." For unfathomable reasons, they generally don't treat our people any better than anyone else. Their experiences, coupled with letters from readers like you, usually tell the tale. While there are far too many variables involved for us to assign a rating to the level of customer service a company provides, we will certainly continue to mention any that we find unacceptable.—Ed.

Keeping an Eye on IBM

Although I enjoyed your two articles about IBM watchers ("Watching IBM for a Living," "The World According to the



Gartner Group," *PC*, Volume 3 Number 9) it was a disappointment that they didn't answer some of my questions. How do these analysts make their predictions? How do they work and collect data? How have they developed so many industry sources when regular reporters have not?

When I read their predictions in newspapers and magazines, I often note that they claim to have predicted certain events. How do their predictions differ from good old astrology? Has anyone ever attempted to compare their predictions in print with what actually developed later?

Merryl Polen
Elmont, New York

Competition being what it is, it's unlikely that the IBM watchers will divulge their data collection methods or prediction techniques. Some rely on traditional surveying, canvassing, and tabulation. Others extrapolate from the miasma of product announcements, pricing strategies, off-the-cuff conversations, and rumors. And others, I'm sure, rely on astrology. As for their overall effectiveness, you'll have to ask the customers who have paid them all that money.—Ed.

Portable Limitations

I purchased an IBM Portable PC and had to return it because of some limitations. IBM states that to be of use, the following must reside in slot 2: 64/256K Memory Expansion Option, IBM PC Cluster Adapter, or Expansion Unit 001 Hard Disk. If you want the hard disk you cannot have more than 256K of memory. The IBM Product Center has refunded my money and I have ordered an IBM PC-XT.

Peter Hanson
Arlington, Texas

What you say is true if you stick to IBM expansion boards. The increasing number of short boards that provide memory or (non-IBM) network functions gives you a shot at a hard-disk Portable PC with half a meg of memory and a half-height hard disk. The expansion slots don't know or care what's plugged into them, so the only reason to use the full-length slot is if you can't find the functionality you're looking for in a half-size board.—Ed.

Printing Records

George D. Hughes' article "A MicroPro Family Portrait" (*PC*, Volume 3 Number 8) gives a good overview of MicroPro's family of software, which is the foundation of my software library. In describing *MailMerge* the author states: "With the conditional commands IF and EXCEPT, you can choose which form letters or address labels to print." However, nowhere in the *MailMerge* manual (Version 3.3) can I find any mention of conditional commands or any other command for printing only selected records from a data file. I'm beginning to wonder whether there really is such a command for *Mail-*

This one sloppy floppy can

THE SLOPPY FLOPPY

Most companies seal their discs with a spot here, a spot there. Leaving most of each seam not sealed at all.

Sooner or later, the seams might do what comes naturally: they bulge. Warp. Pucker. Open up.

You can prove it to yourself. Just take a floppy and twist it.

See those wide open spaces?

That's sloppy. And dangerous. Because if you put a sloppy floppy into your disc drive, it can jam the drive. Lose your data. Or ruin the drive head.

And there goes $400.

Memorex is a registered trademark of Memorex Corporation
©1984 Memorex Corporation
A Burroughs Company

ruin your $400 disc drive.

THE MEMOREX® SOLID-SEAM BONDED FLOPPY

Memorex seals its floppy discs with a process it developed, called Solid-Seam Bonding.

Solid-Seam Bonding seals shut every inch of every seam of every Memorex floppy disc. Tight as a drum. That makes the Memorex floppy stiffer. Stronger. And your data safer.

You can prove it yourself. Just take a Memorex floppy and twist it. You'll see no wide open spaces.

No wide open spaces that can jam your drive. Lose your data. Or ruin your drive head.

Which could cost you $400.

So why risk it?

Protect your drive. And your data. Ask for Memorex floppy discs, with Solid-Seam Bonding.

It's always better to be safe than sloppy.

For more information on the full line of Memorex quality computer media products, including computer tape, call toll-free: 800-222-1150. In Alaska and Hawaii call collect: 408-987-2961.

Your Data. When it matters, make it Memorex.™

MEMOREX

CIRCLE 345 ON READER SERVICE CARD

Merge? How can I get *MailMerge* to print selected records?

Lynne Bonner Burke
Washington, DC

George D. Hughes replies:
Chapter 5 in the MailMerge Reference Manual *(Version 3.3), titled "Conditional Printing," gives all the information and commands you are looking for. The .IF, .EX, and .EF commands are the main ones you'll probably need. These conditional IF and EXCEPT commands, when properly placed, allow you to skip over part or all of a document, form letter, or address label. Read pages 5-1 to 5-16 for a more detailed explanation.*

A Powerful Language

In Volume 3 Number 6 of *PC*, there were several articles comparing the execution and compilation times of Modula-2 to Pascal and other languages. However, the authors failed to compare Modula-2 to what I consider to be a much more powerful language—Turbo Pascal.

Turbo Pascal has many of the same enhancements that Modula-2 has, such as flexible declarations, ELSE added to CASE, HALT, long identifiers, constant restrictions relaxed, and machine-level access. It isn't necessary to go to Modula-2.

I think there is a serious need to explain the strengths of Turbo Pascal.

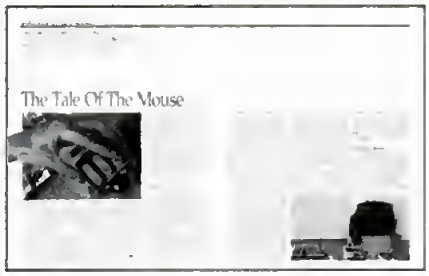
Richard N. Day
Birmingham, Michigan

We agree that Turbo Pascal is a fine product, one that we will review in an upcoming issue. The enhancements you mention are part of the ongoing problem with Pascal. Extending a language beyond its intended scope ruins transportability and drives programmers crazy.—Ed.

Trying to Catch a Mouse

I read an article in a recent *PC* that referred me back to "The Tale of The Mouse" by Paul Somerson (*PC*, Volume 1 Number 10). Near the end of that article it was mentioned that the Japanese were going to be selling mice for as little as $10 to $15, but that by the end of 1983 they would have been available for under $50.

Can you tell me if this came to be, and if so, where can the mice be purchased? I am looking for an inexpensive device to



trace graphics from paper to screen. I can handle the software side; now I need to locate one of these beasts.

Lee Bayley
Chattaroy, Washington

*Slow acceptance of the mouse has delayed the inevitable price erosion. See "Alternate Input Devices" (*PC, *Volume 3 Number 12) for some solutions to your problems.—Ed.*

Clocking the PC

I'd like to make a correction to Stephen P. Smith's article "Metastring Magic" (*PC*, Volume 3 Number 8). I tried to redefine my shift function keys but it would not work. After consulting my BASIC manual, I found that the keyboard codes presented in Figure 2 (page 405) were incorrect. Instead of ranging from 59 to 68, the key codes actually go from 84 to 93.

Furthermore, Smith's clock doesn't work as it should. $e[60c is not understood by the machine. After toying with the keyboard for a while, I discovered that continuously typing the following on one line will display the time on the upper right-hand corner without altering the rest of the display:

```
PROMPT $e[s$e[1;69f$t$h$h
$h$h$h$h$e[u$n$g
```

Of course, the ANSI.SYS instruction has to reside in the CONFIG.SYS when the system is booted for this prompt instruction to work.

Benjamin Sasso
San Jose, Costa Rica

Stephen Smith replies:
The key codes for the shifted function keys should be 84 to 93, not 59 to 68. Several other readers also discovered the error.

Sasso also complains that the metastring to produce the clock display doesn't work, but in this case he has made an error. He entered $e[60c (lowercase c) and found that ANSI.SYS did not respond. What was published, and what he should have entered, was $e[60C (uppercase C). Commands to ANSI.SYS must be in the correct case, and it does make a difference which one you use. The alternate metastring that Sasso worked out to get around his problem also produces the clock display.

Stick to the Rules

After hearing from software writers, publishers, and brokers on the subject of copy protection, I would think that the one sure area of safety would be among one's own: others in the computer-related business community. It seems that this is not so.

Recently, I attended a computer show that is held in St. Louis annually. I saw all the latest software, peripherals, and hardware for micro- and minicomputers. Imagine my surprise when I went by several booths and saw what appeared to be illegal copies of software running or resting beside computers! One hardware manufacturer didn't even attempt to hide the fact that they were running bogus copies. When I discussed this with a representative of one software house, he replied, "Well, we own the original." True, but Corona and Eagle bought IBM PCs too before writing the ROMs they later agreed to change. Owning them didn't give them the right to copy them.

Perhaps next in line should be an over-the-shoulder glance at the same folks who want to have their products protected. Our show was not very big, but I saw at least

Minis and mainframes have used WordMARC for four years. Now there's WordMARC word processing for your micro.

Originally created for minis and mainframes, WordMARC is now available for use on your micro*. And quite simply, it's the best office-quality word processing software package a micro user could buy. After all, it was the best word processor mainframe and mini users like universities, national laboratories, and Fortune 500 companies could find over the last four years. But, if you need more proof, read on.

☐ *No Problems, No Nonsense, No Competition.* For starters, everything you see on your screen appears exactly as it will be printed on paper. Scientific notation. Foreign language characters. Underlining. Subscripts. Everything. ☐ *A Partial List of Features. That's Right, Partial.* Menu driven w/function keys. Easy self-paced tutorials. Spelling checker. Mail merge. Scientific notation. Foreign language characters. Automatic reformatting. Automatic pagination. Document recovery system. Document encryption. ASCII file handling. And so on. ☐ *If Word Processing's Your Call, Call 800-831-2400.* Granted, just because the call is free is no reason for picking up the phone. You should stop and consider our track record with minis and mainframes. You should stop and think what that can mean for your micro. And you should stop thinking about any other word processing software. OK. Now that you've done that, it's time to pick up the phone.

*WordMARC is compatible with the IBM PC or XT, as well as the Eagle, Compaq, Corona, NCR PC, DEC Rainbow, and TI Professional computers. All versions of WordMARC on micro, mini and mainframe computers are compatible.

MARC Software International, Inc.
260 Sheridan Avenue, Suite 200
Palo Alto, California 94306
800-831-2400 ☐ In Calif., 800-437-9900

*WordMARC is a trademark of MARC Software International, Inc © 1984 MSI, Inc IBM PC and XT, Eagle, Compaq, Corona, NCR PC, DEC Rainbow, and TI Professional Computers are trademarks, respectively of International Business Machines Corporation, Eagle Computer, Inc., Compaq Computer Corporation, Corona Data Systems, Inc , NCR Corporation, Digital Equipment Corporation, and Texas Instruments.

Printed On An Epson Printer

By The Fancy Font® System

Letter Quality

Say goodbye to correspondence quality and hello to *Fancy Font*'s high-resolution, proportionally spaced, letter quality. *Fancy Font* provides fonts in sizes from 8 to 40 points, styles include Roman, Bold, Italic, Script, Old English, and more. All this on low-cost Epson (MX, RX, FX) and Gemini 10X printers. *Fancy Font* is an easy-to-use software package for CP/M and IBM PC compatible systems; no special hardware or installation is required.

Create Your Own Characters

You can use over 30 font sets in the *Fancy Font* package and furthermore, can create any new characters or logos you like, up to 1 inch by 1 inch. A database of over 1500 characters is included that makes it possible to print foreign languages and mathematical notations.

Font Style Samples

small medium large **Bold** *Italic*

Sans Serif *Script* Old English

$$A = \int_0^{\circ} \sqrt{a^2 - x^2}\, dx$$

Φ Ψ Ω ℬ ℭ б Д ж ± ÷ ≠ ≦ ≧ ♧ @ § ♌ ○ • ♯ ♮ ♭

Numerous Applications

Fancy Font customers, numbering in the thousands, are constantly discovering new applications.

- Business and personal letters
- Custom forms, invoices, labels, signs
- Foreign Languages
- Mathematical Notation, Greek
- Super- and Sub-scripts
- View Graphs
- Custom Letterheads
- Resumés
- Articles for publication
- Newsletters, brochures
- Complete manuals
- Advertisements
- Invitations, place cards

InfoWorld
Software Report Card

Fancy Font

	Poor	Fair	Good	Excellent
Performance	☐	☐	☐	☑
Documentation	☐	☐	☐	☑
Ease of Use	☐	☐	☑	☐
Error Handling	☐	☐	☐	☑

Copyright, 1983 by Popular Computing, Inc., a subsidiary of CW Communications, Inc. Reprinted from InfoWorld, 5/2/83

(This ad was printed on an Epson MX-80 printer. Call for an actual sample.)

Highlight: IBM and CP/M order now – (800) 351-0500 – M/C Visa

"The quality of print is excellent, and the variety of type styles and sizes is even better."
Pat McKeague, InfoWorld, 5/2/83

Available for Epson FX, MX, RX, Gemini 10X, IBM Graphics Printer, Riteman Inforunner, TI 855/850, Citoh and NEC8023 (IBMPC only)

SoftCraft, Inc., 222 State St. Suite 400, Madison, WI 53703
(We've moved from California) phone: (608) 257-3300

Fancy Font System	$180.00
Fancy Font Demo Disk	$ 10.00[1]
Calif. and Wis. residents add sales tax	
Outside US add $10 (only $2 for demo) postage	

Diskette Format:
☐ 8" CP/M ☐ Epson QX10 ☐ Osborne ☐ Kaypro
☐ IBM PC[2] ☐ Victor 9000[2] ☐ Apple CP/M[3]

[1] $7.50 applicable towards purchase of Fancy Font
[2] PCDOS/MSDOS systems require 128K memory. IBM printer works
[3] Fully transparent 8-bit printer interface required

CIRCLE 184 ON READER SERVICE CARD

LETTERS TO PC

three different booths running bogus copies of Lotus' *1-2-3*. How could I tell? All of the programs had hand-written labels on them—that's a dead giveaway.

It seems to me that until the industry's own people learn to keep to the rules, those who use and buy will go ahead and copy at will.

David R. Blair
Fenton, Missouri

Update Request

Please consider updating the comparative survey of word processing programs, originally in Volume 1 Number 7. I purchased *EasyWriter*, Version 1.1 but now I'd like a replacement. A lot has happened since your original comparison, and I'd like to read an update.

Ed Clarke
Ponoka, Alberta, Canada

You're in luck. We'll be publishing a comprehensive round-up of word processing programs. Look for it to start sometime this fall.—Ed.

True Value

Although I frequently find myself wanting to respond to articles published in *PC* and other magazines, I rarely take the trouble to sit down and write a response. My sense of duty was finally aroused when I sat down with your May 15 issue that featured a "Guest Editorial" from Adam Osborne, the erstwhile hardware manufacturer and head cheerleader for the "all-software-is-overpriced" camp.

What I found most objectionable about Osborne's mindless dribble were the two assertions that "The average personal productivity software package costs $500 and consists of a thin, badly written, badly reproduced sheaf of documentation and a floppy disk . . ." and that "No industry can get away for long with a $500 price tag on a product that costs $7 to produce."

The first assertion is simply false. As the owner of several computers and a lot of software, there have been very few packages for which I have paid even close to

$500. I can only say that for the most part, the experience has been a mixture of nervous anticipation, some exhilaration, some disappointment, but generally an overall good time. Lotus' *1-2-3* comes to mind as a total refutation of Osborne's attack.

More nefarious is his second assertion. Osborne essentially equates the value of software with the material cost of its physical components. Does Osborne really think that a product having a physical cost of $7 can have no higher value? As an attorney, I have labored long and late over very productive research. I wonder how long I would be able to remain in practice if I charged my clients the $5 or so that my research memoranda actually "cost" me.

It takes professional programmers a lot of time, a lot of trouble, and a lot of Tylenol to put out the kind of programs that can make it to the shelves, let alone command a $500 price tag. The idea that the value of one's collective labor cannot morally exceed the cost of the physical media upon which it is finally delivered to the marketplace is one that I am sure all of your readers will find surprising.

Robert Perez
San Jose, California

Has Osborne Miscalculated?

Adam Osborne's guest editorial, "An Adolescent in Disguise" presents some "facts" that just aren't true (*PC*, Volume 3 Number 9). First, he asserts that "Lotus has been shipping between 7,000 and 12,000 packages of *1-2-3* per month." According to my calculations, if Lotus bypasses distribution and delivers *1-2-3* to the retail chains directly, then they clear $250 on each $495 list price package (we have seen *1-2-3* sold for as little as $299). Since Lotus just sold $28,269,000 in the first quarter of 1984, and since Lotus was still a one-product company at that time, then they sold at least 113,000 *1-2-3* packages, right? If they went through distribution and got less than $250 per copy of 1-2-3, their sales would be even higher.

Organize your non-IBM monitor with Curtis

new from curtis

tilt 22°
swivel 360°

NEW! Reduce monitor glare and improve sight angle with Curtis' new, universal UNI-1—the low profile (only 2"), tilt and swivel base designed to fit any non-IBM monitor*.

UNI-1 Low Profile, Universal Tilt and Swivel Base. 49.95
***(for any monitor that will fit on a 13"square)**

The new Curtis UNI-1 lets you easily adjust the monitor sight angle to minimize screen glare. Virtually eliminates backache, eye strain and operator fatigue. The UNI-1 makes your monitor easy to use, while making you more comfortable. Fully ventilated base for cooler monitor operation and longer life.

Speaking of easy to use...

How about turning your non-IBM monitor ON (or OFF) at the same time as your system?

NEW! With the new PA-1 monitor cable from Curtis you can power up your Amdek, PGS, or any non-IBM monitor with just a single flick of the systems unit switch. Adapts any monitor to systems unit power outlet.

PA-1 Monitor Plug Adapter 8.95
(adapts any monitor power cable to IBM PC)

New products from Curtis...

Get organized, get comfortable Curtis also manufactures many other products exclusively for the IBM PC. Curtis products below have a lifetime warranty and are a perfect PC match in color, style, and finish.

PC Pedestal™ Tilt and Swivel Base 79.95
(for IBM PC Monochrome and Color Displays)
AD-I Adapter for PC Pedestal™ 9.95
(for Princeton Graphics Systems and Quadchrome Displays)
SS-I System Stand 24.95
(to position IBM PC Systems Unit vertically)
EC-I 3' Extension Cable Set 49.95
(for IBM PC Monochrome Display)
EC-II 3' to 9' Extension Cable 39.95
(for IBM PC keyboard)
EC-IV 3' Extension Cable Set 57.95
(for IBM or Quadchrome Color Displays)

Manufacturing Company, Inc.
CURTIS
Curtis Manufacturing Company, Inc
Peterborough, NH 03458

Available at all ComputerLand Stores, Entré Computer Centers, ComputerMarts, Micro Age or your local PC dealer. Over 800 locations nationally.
In Canada RMP Ltd., P.O. Box 251, Ajax, Ontario, Canada L1S 3C3, (416) 668-4048
For the dealer nearest you call (603) 924-7803

Copyright 1984 Curtis Manufacturing Co., Inc.

Softline

FOR YOUR BOTTOM LINE.

Lotus 1-2-3	dBase III	WordStar Professional	Multi Mate
$319	$CALL	$359	$279

WORD PROCESSING/ EDITORS

Easywriter II System (3 pak)	$219
Edix/Wordix	$269
Final Word	$189
Microsoft Word	$239
Microsoft Word/Mouse	$299
Multimate	$279
PeachText 5000	$219
Perfect Writer/Speller	$249
PFS Write	$ 95
Samna Word II	$329
Select Word Processor	$199
Spellbinder	$249
SuperWriter	$179
Volkswriter Deluxe	$179
The Word Plus (Oasis)	$109
Word Perfect (SSI)	$Call
WordPlus PC with The Boss	$329
WordStar	$239
WordStar Professional (WS MM/SS/SI)	$359
WordStar Options Pak (MM/SS/SI)	$189

DATABASE SYSTEMS

Alpha Beta Base Manager II	$179
Condor III	$329
dBase II	$369
DBplus	$ 89
Friday	$179
InfoStar	$269
Knowledgeman	$299
Perfect Filer	$159
Personal Pearl	$199
PFS File/PFS Report	$169
Powerbase	$289
QuickCode	$169
R base 4000	$289
T/Maker III	$199
TIM IV	$269
Versaform	$249

SPREADSHEETS/ INTEGRATED PACKAGES

Framework	$Call
InfoCalc	$189
Jeck 2	$329
Lotus 1-2-3	$319
Multiplan	$135
Open Access	$399
Ovation	$Call
SuperCalc 3	$239
Symphony	$Call
TKI Solver	$289
VisiCalc IV	$159

PROJECT MANAGEMENT

Harvard Project Manager	$269
InfoPert/Plan	$239
Scitor Project Scheduler	$229
VisiSchedule	$199

GRAPHICS/STATISTICS

Abstat	$279
BPS Business Graphics	$229
Chartmen Combo (II&IV)	$349
Chartmaster	$259
dGraph	$189
Energraphics	$259
Fast Graphs	$199
Graphwriter Combo	$429
PC Draw	$289
PFS Graph	$ 95
Stetpac	$299

ACCOUNTING MODULES

Ask Micro Accounting	$299
BPI Accounting	$369
IUS EasyBusiness System	$319
MBA Accounting	$369
Open Systems Accounting	$459
Peachpak 4 (GL/AP/AR)	$239
Peachtree Accounting	$399
Real World Accounting	$469
Star Accounting Partner (GL/AP/AR/PAY)	$269

PROFESSIONAL DEVELOPMENT

Management Edge	$139
Think Tank	$179

HOME/PERSONAL FINANCE

Dollars and Sense	$119
Financier II	$119
Home Accountant Plus	$ 59
Tax Preparar 84	$189

LANGUAGES/UTILITIES

Access Manager	$239
Digitel Reseerch C Compiler	$219
Display Manager	$299
Microsoft C Compiler	$329
MS Basic Compiler	$249
MS Fortran	$239
Pascel MT+86	$249
Norton Utilities	$ 59

COMMUNICATIONS/ PRODUCTIVITY TOOLS

Crosstalk	$119
Memory Shift	$ 79
Move It	$109
Prokey 3.0	$ 95
Smartcom II	$109

HARDWARE PERIPHERALS*

AST Six Pack Plus (64k)	$269
Quadboard (0k)	$209
Hayes 1200B with Smartcom	$399
Heyes Smartmodem 1200	$499
Hercules Graphics Board	$349
Epson FX 100 Printer	$Call
Comrex II Printer	$Call
C Itoh Prowriter	$Call
C Itoh Starwriter	$1199
Dividata 93A	$749
64K Memory	$ 55

*Call for shipping

R: base 4000	Word & Mouse	Microsoft C Compiler	Smartmodem 1200B
$289	$299	$329	$399

free!
Diskette Library Case
with your order

DISCOUNT COUPONS
With each order, we offer **discount coupons** worth up to $10 on your next order.

1-800-221-1260
In New York State call (212) 438-6057

TERMS
Checks—allow 14 days to clear. Credit processing—add 3% COD orders—cash M O or certified check—add $3.00. Shipping and handling UPS surface—add $3.00 per item (UPS Blue $6.00 per item). NY State Residents—add applicable sales tax. All prices subject to change

MasterCard VISA

Softline
Softline Corporation
3060 Bedford Ave. Brooklyn, NY 11210
TELEX 421047 ATLN UI

LETTERS TO PC

113,000 over 3 months is more than 37,000 a month—where in the world did Osborne come up with 7,000–12,000 a month?

The entire point of Osborne's argument, that Lotus is not selling nearly as many software packages as it should, is exactly wrong. Lotus has, in fact, saturated the market!

Hal W. Hardenbergh
Santa Ana, Califomia

Noteworthy Notebook

I'm a new owner of *Notebook* by Pro/Tem and Digital Marketing and I am completely delighted with the program, the manual, and the tutorial. At last, someone obviously experienced in communication and who does not assume that we are all eggheads has written the manual. At last, computer users have a tutorial that instructs, tutors, and is fun to use. At last, after searching for a database management system I found one that didn't cost an arm and a leg. I think *Notebook* is versatile and easy to use.

May their bank accounts be filled with gold! May every database management system searcher be so lucky!

Jack B. Scarcliff
Akron, Ohio

Correction:

The telephone number for R & L Software is (617) 964-0992 ("A Plot Fit for a Scientist," *PC*, Volume 3 Number 9).

How to Write to PC

Do you have a comment, compliment, or criticism about something you read in *PC*? A question you'd like to open up to other readers? Send it to "Letters to PC," *PC Magazine*, One Park Avenue, New York, NY 10016. We are not able to answer letters personally.

All letters become property of *PC Magazine* and may be subject to editing. We cannot print letters that do not include a name and address. ■

26 REASONS TO SUBSCRIBE TO PC

Your subscription will bring you 26 big issues every year of the most up-to-date facts and technological breakthroughs that affect you and your IBM or compatible personal computer. 26 big issues of *PC* delivered to your door AT UNBELIEVABLE SAVINGS!

Every other week you'll get a library of professional insights including latest coverage of newly-released hardware and peripherals. You'll find timely information on innovations in programming, applications and networking. You'll communicate with professionals and users like yourself and get reviews of new software packages, some before they even hit the shelves.

You can subscribe to *PC*, The Independent Guide To IBM Personal Computers for as little as $1.02 an issue! Use the attached card or the coupon at right TO SUBSCRIBE TODAY!

GET THE MOST UP-TO-DATE INFORMATION FOR YOU AND YOUR PC WITH *PC*, 26 TIMES A YEAR!

26 SUBSCRIBE TO PC 26

P.O. BOX 2443 • BOULDER, CO 80322

YES, Please enter my subscription to *PC* for:

- ☐ 26 issues (one year) for only $29.97...LESS THAN $1.16 A COPY!
- ☐ 52 issues for only $52.97...LESS THAN $1.02 A COPY!

Full one-year subscription price $34.97. Single copy price $2.50.

Mr./Mrs./Ms._____
please print name in full

PC4S408

Company_____

Address_____

City_____ State_____ Zip_____

Check one: ☐ Payment enclosed ☐ Bill me later

Charge my: ☐ American Express ☐ Visa ☐ MasterCard

Card No._____ Exp. Date_____

Add $52 a year for postage to Canada and all other foreign countries. Please allow 30 to 60 days for delivery of first issue.

MICROSOFT PRESS

Microsoft-DOS is now used on over 3 million 16-bit personal computers. Chances are one of these computers is yours.

If so, you need RUNNING MS-DOS, the ultimate sourcebook for mastering the full power of the software that tells your computer how to think. Here, for the first time, is inside information that will enable you to streamline your computer, set up a multi-level filing system, employ the text editor, build and sort a miniature database, create customized commands, and manage your monitor, printer, disk drives and modem.

Microsoft developed MS-DOS for the Intel 8088-based IBM PC. Author Van Wolverton brings years of experience writing for IBM and Intel. RUNNING MS-DOS. Another classic from Microsoft Press.

$19.95 wherever fine books are sold.

Microsoft Press
10700 Northup Way
Bellevue, Washington 98004

A Modest Proposal On Compatibility

Norton stumbles onto a clever solution to the ever-present software compatibility problem but then realizes that his brilliant notion may be nothing more than pie-in-the-sky.

Whenever I have a great idea, it's an accident. I had one 2 weeks ago, and I can assure you that I stumbled upon it accidentally—so accidentally, in fact, that it took me a couple of weeks to realize how good an idea it was.

Sitting on my desk is the Texas Instruments (TI) Portable Professional Computer. It's luggable and has a high-resolution, full-color, very legible display screen and a 10-megabyte hard disk drive built in. Its computing value is wonderful; its IBM compatibility stinks. Can I use it? No. My workhorse IBM software won't run on it.

In my last column, I discussed the difficulties of producing DOS-generic software—programs that would run on nearly any reasonable MS-DOS computer including IBM's own compatibles like Compaq, and the more exotic machines like the Wang and TI PCs. I argued that the main problems of compatibility involved the methods used to throw display information onto the screen.

Design Choices

Why should you and I care about these other machines? Isn't the PC dandy enough? It certainly is for me, but it isn't necessarily so for everyone. For example, our PC is relatively slow, compared to what it could be, because of the microprocessor IBM chose for it, the 8088, and the clock speed IBM chose to drive it, 4.77 MHz. These fundamentals determine its overall computing performance. Many factors go into these sorts of decisions, such as the availability of chips, including any hot new ones, at the time the computer is designed. Some recent PC imitators that faced different market conditions and made different decisions can run circles around IBM's PC. For example, the PC-compatible box that forms the heart of both the Sperry PC and the Leading Edge PC has a "turbo" switch that allows it to run at a faster clock time. And the Tandy 2000 uses a much hotter microprocessor, the 80186, a really souped-up version of the PC's 8088.

Peter Norton

Besides raw performance, other features people might want in a personal computer just aren't available in our IBM PC—higher-resolution graphics is one, a richer choice of screen colors is another. There is a world of possibilities in personal computing that our PC doesn't offer; no one machine could have it all.

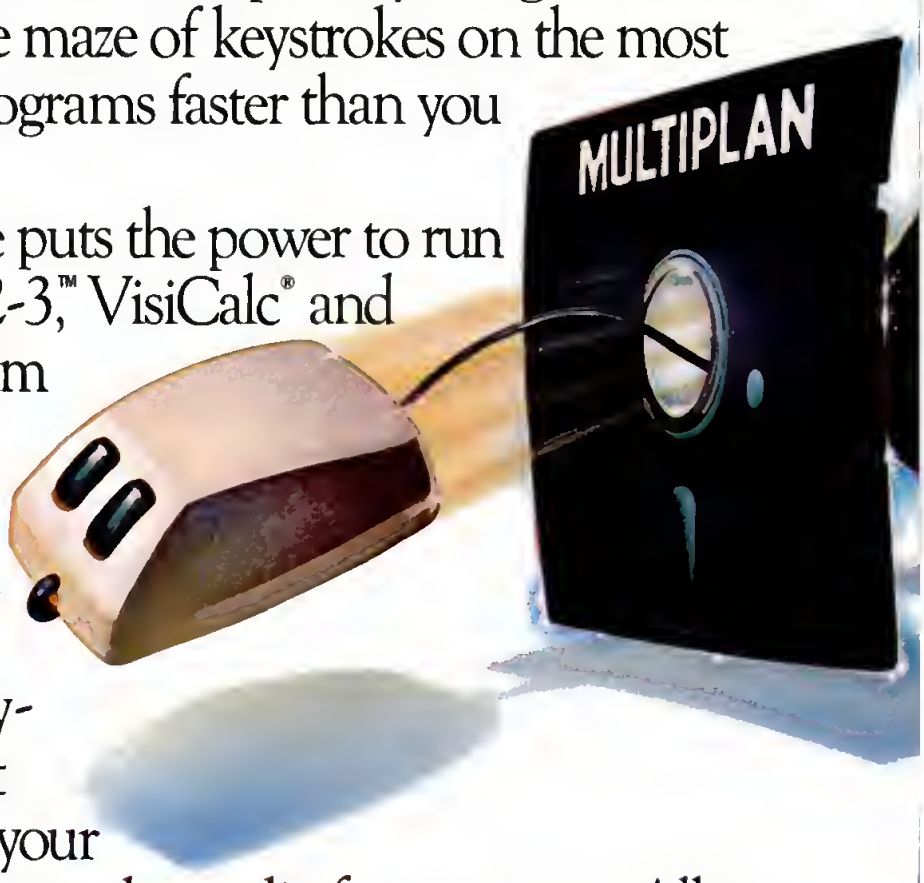
The problem is, we need more than hot machines. We need hot software too. And that's why so many people buy IBM and fully IBM-compatible computers, who might otherwise prefer to have the features that come with a TI Professional, a Tandy, or a Wang. The most important feature of the IBM PC is its dynamite library of programs. If we choose another machine for some spiffy hardware feature, we may have to give up the PC's huge and powerful software library.

If software developers want to write programs that can run on almost any computer, they are faced with some tough problems. BASIC, which most DOS computers run, offers one possible solution for programs that can put up with BASIC's drawbacks (slow speed is the foremost). IBM's version of BASIC has wonderfully powerful features, particularly for screen control. Most DOS computers come these days with a version of BASIC known as GWBASIC that matches most of IBM BASIC's features. Using GWBASIC, our IBM programs can be easily moved from

Get yourself a

This little critter comes with specially-designed software that flies through the maze of keystrokes on the most popular business programs faster than you can say "cheese."

Microsoft® Mouse puts the power to run Multiplan,® Lotus 1-2-3,™ VisiCalc® and WordStar® in the palm of your hand. Click the left button on the mouse, a custom menu appears. In English, not hieroglyphics. Click the right button and execute your command: move text or data, edit, format, print. All at blinding speed without touching the keyboard.

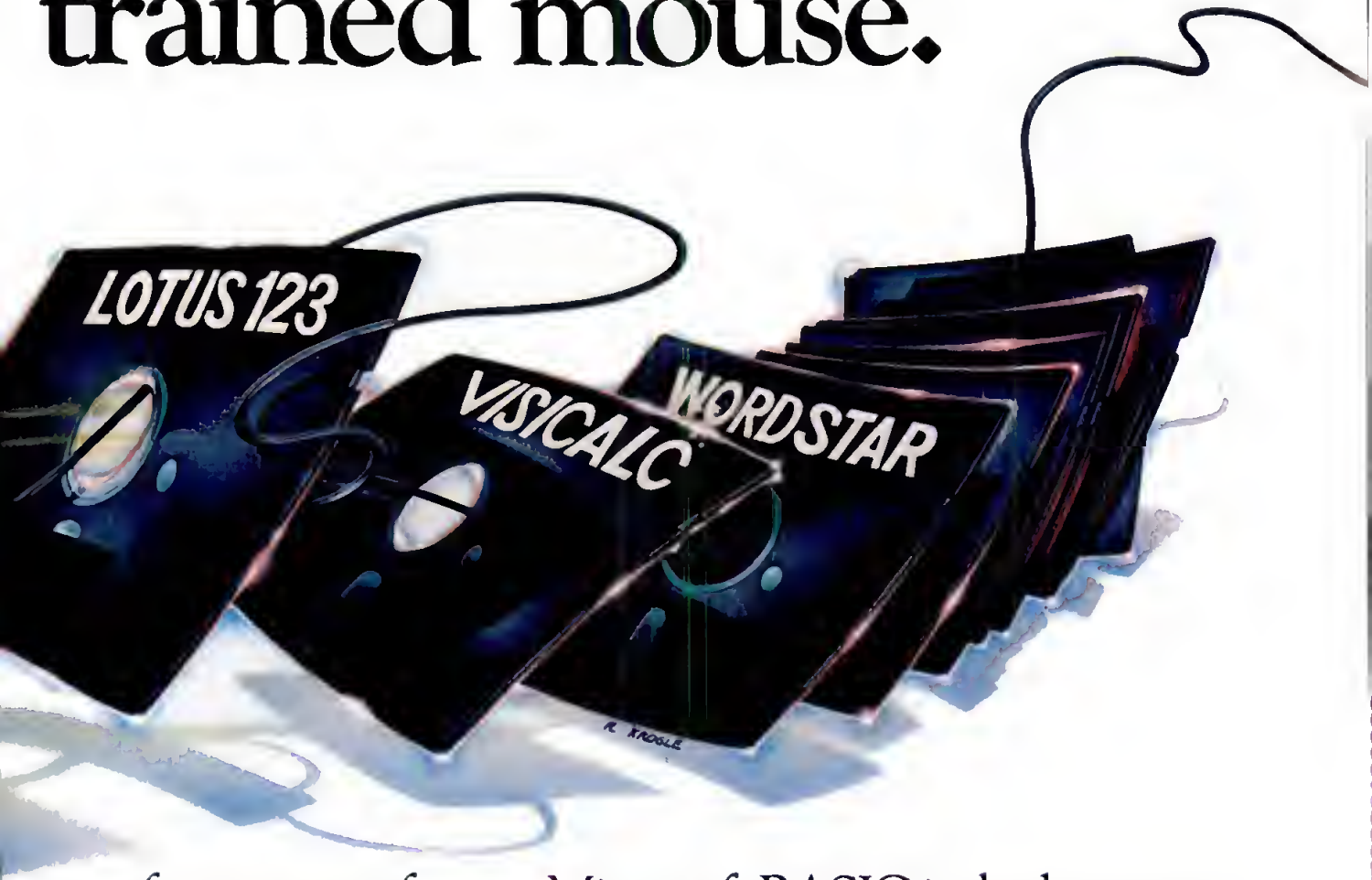


It also lets you create your own menus for editing and formatting existing application programs. So people can learn programs quicker and do more productive work as they learn.

The mightiest mouse.

Microsoft Mouse runs circles around other mice. It is the high performance mouse for the IBM® PC and PC XT. From the company known for high

trained mouse.



performance software. Microsoft BASIC is the language spoken by nine out of ten microcomputers worldwide.

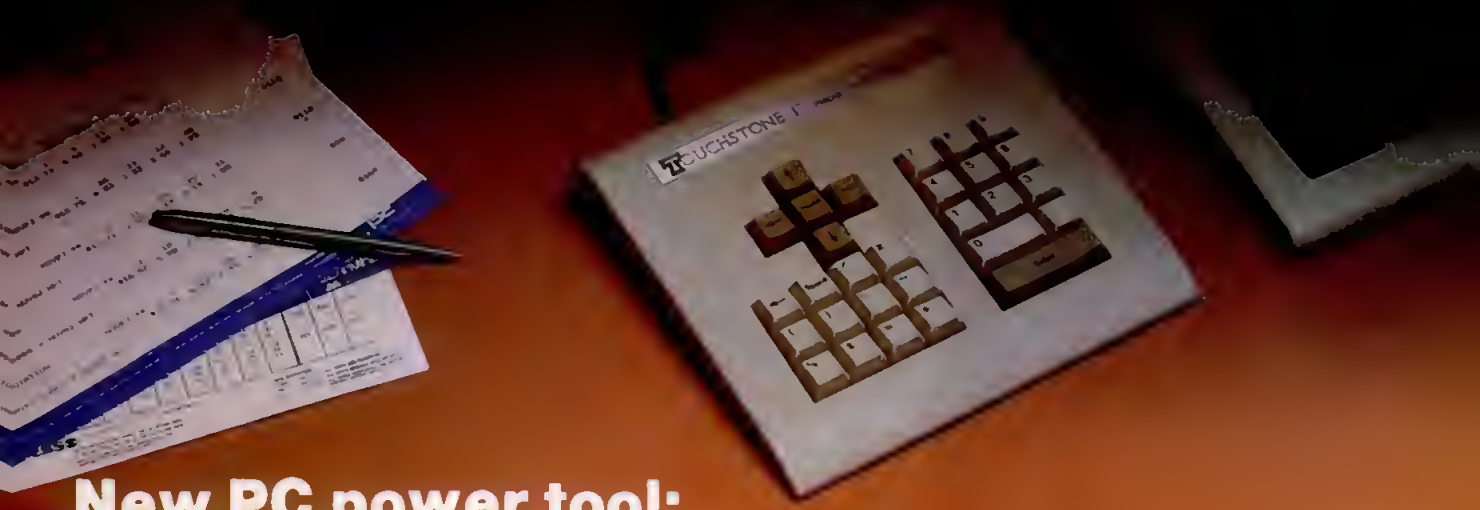
MICROSOFT®
The High Performance Software

Our MS™-DOS operating system tells your IBM PC how to think.

So don't monkey around with any other mouse. Call 800-426-9400 (in Washington State call 206-828-8088) for the name of your nearest Microsoft dealer. Then go with Microsoft Mouse. The mouse that soars.

Microsoft and Multiplan are registered trademarks and MS is a trademark of Microsoft Corporation
Lotus 1-2-3 is a trademark of Lotus Development Corporation. VisiCalc
is a registered trademark of VisiCorp. WordStar is a registered trademark of MicroPro
IBM is a registered trademark of International Business Machines Corporation

TOUCHSTONE 1



New PC power tool; cuts data-entry time in half.

While everyone else is jumping all over the place hunting for numbers one digit at a time, you'll be breezing along, entering whole strings of numbers without even looking...at your TOUCHSTONE 1™ rapid data controller.

Conceived by a financial analyst and PC user...

..Touchstone 1 was designed as a productivity tool for people who enter and revise numeric data...in spreadsheets, accounting systems, inventory control and similar applications. Touchstone means quick answers to important business questions.

The right keys...right at your fingertips...right now

Imagine...$, %, and ( ) for compound math formulas–without shifting. Separate cursor keys and efficient numeric layout let you forget the NUMLOCK ever existed. The Touchstone 1 has its own enter key, as well as backspace, space, home, period, comma, slash and equals; plus add, subtract, multiply and divide.

Reliable performance

The Touchstone 1 has its own [illegible] microprocessor with 16-[illegible]er buffer and patented [illegible] Elimination system. [illegible]over ensures positive entry of every keystroke, even when a previous key has not been fully released.

Quiet full-travel keyswitches are rated for 50 million cycles; contacts are covered by a protective membrane to guard against dirt, dust and accidental spills.

Touchstone 1: Built so well it carries a full, one-year warranty, plus a 15-day money-back guarantee.

Superior ergonomics

Low-profile design meets DIN specs; reduces fatigue and back, neck and eye strain. Heavy-duty case is easily lap-portable, but won't slide around. Standard locating pip on 5 key, helps keep fingers where they belong.

Enter numbers twice as fast

Touchstone 1 data entry takes about 40% of the movement required with the standard PC keyboard. Even more important, you don't have to take the time to look for each digit.

An example; the formula:
((43818x12) + (52x147.3)/(47/12))
Using the standard PC keyboard (forget the PC number pad unless you can cope with the NUMLOCK), this formula takes 37 keystrokes including 6 shifts, and hand movement totalling 137 inches. With the Touchstone 1 keypad, the same formula is entered with 31 strokes, including NO shifts, and total hand movement of just 57 inches.

A plug-compatible workmate for the IBM PC and XT

Split cable and standard connectors allow you to use the Touchstone 1 alone or side-by-side with the main keyboard. When used together, any key can be entered from either keyboard anytime.

An investment in greater efficiency

Until now, numeric data entry has been the most tedious part of PC operation. If you have better things to do with your time, you really should consider investing in a Touchstone. Only $169.95. Order by mail or phone for immediate shipment, or ask for it at leading computer stores.

CALL TOLL FREE

1-800-828-6968

In New York 1-800-462-4891

9am-9pm Monday thru Saturday

CIRCLE 507 ON READER SERVICE CARD

[illegible]mber and payment [illegible]t card [illegible] New York [illegible]

TOUCHSTONE TECHNOLOGY INC.

955 Buffalo Road • P.O. Box 24854
Rochester, New York 14624

one computer to another, but frankly, BASIC doesn't cut it for the most demanding software needs: you'll never see a *1-2-3* or a *Framework* written in BASIC.

Without a hand-holding intermediary like BASIC, programs can't cope with the crucial differences between computers, particularly those related to how information is displayed on the screen. This area is a major obstacle to transportability.

Microsoft's Solution

The slickest solution to this problem that I have seen is the customized screen driver that Microsoft uses for its programs like *Word* and *Multiplan*. Internally, these programs do their own work in a standard way. When it comes to talking to the display screen (or working with any keyboard peculiarities) the Microsoft programs work through a driver, which can be customized to support an impressive array of machines. If you've ever used the Microsoft INSTALL program, which does this job, you've seen what I'm talking about.

If you haven't seen it in action, let me describe it for you. Normally when we get a new program such as *Multiplan*, we ignore the program's documentation and instructions, and we just try to run it. With the INSTALL program system, what happens next is that *Multiplan* says, "You've got to 'install' me first." So, we try running the INSTALL program. This program describes what it's going to do, it gives us an impressively long list of computers to choose from, we tell it which computer we're using, and then the INSTALL program puts a specific set of subroutines for that computer into the program that we've bought. The whole process takes about 30 seconds, start to finish. When it's done, we try our program again, and it works to perfection on the computer we're using. To experiment, I tried installing *Multiplan* on all the machines I had, including PCs, PC*jr*s (the PC*jr* takes a different driver, for some reason), Compaqs (although the Compaq is PC compatible, the driver optimizes the machine's performance) and TIs. It was quick and easy to install *Multiplan* on all of them, and all performed well.

If something like Microsoft's driver were available for every program developer to use, then tons and tons of software could be made to run on a wide variety of computers.

> A widely available INSTALL program could make nearly any software portable.

A widely available INSTALL program could make nearly any software portable and give us much more freedom to roam outside the green IBM pastures.

A Software Consortium

In my last column, I said someone should write such a program and make a mint selling it. Or better yet, I casually added, the hardware manufacturers should band together to fund a public effort to create such a program and then give it away free. It took me a couple of weeks to realize that I had stumbled onto a Great Idea.

Consider it. If it were done right, suddenly a wide variety of computers would become, in effect, PC-compatible. They wouldn't have to be hardware-compatible because all those programs could be effortlessly adapted to each computer.

For non-IBM computer makers, this invention would be an incredible boon. They could make their own computer design decisions and still benefit from all that software.

What would it take to make this idea a reality?

Suppose that all the non-IBM manufacturers of PC-like computers got together and funded a venture to write software and documentation that would allow virtually any program to be transported to every computer on the list. To avoid legal difficulties, I imagine that the venture would have to be completely open—any computer maker could pay the standard dues to join the venture, and all the subscribing computer models would be equally supported. To get wide acceptance among the third-party software houses, the results of this venture—the tools, techniques, and programs needed to make portable software—would be given away free. Why not, after all? The purpose is to ensure that all those computers are supported with software, so that the hardware can be sold on its merits.

The cost of such a venture would be insignificant to a hardware maker. I would guess that it could be done well for roughly $2 million in start-up costs, and maybe $500,000 a year in ongoing funding.

Think of it! You choose the software you want, you choose the hardware you want—mix and match. And all the software runs on all the hardware.

Could this ever happen? Probably not. But I wouldn't count out the idea entirely. All it would take is for a few of the big players to call each other up and bat the idea around. Nothing that I write could make it happen. But if the president of Eagle called a group vice-president of Texas Instruments, who had a chat with the chairman of Tandy. . . . Well, that's how the ball gets rolling.

It probably won't happen because the most important players are Big Companies with Big Bureaucracies, and big companies like to keep things in the fold. It's called the NIH factor: Not Invented Here.

Another obstacle to such a portability venture is the time involved. It would take 6 months or a year to get it started, another half-year or more before the results were ready, and still longer before lots of application programs were adapted to take advantage of the scheme.

My guess is, no matter how much it may benefit all those computer manufacturers (and us as well), such a thing will never come about. It's just another page in the script of the human comedy. ■

Key Tronic Creates

The Professional IBM* PC Keyboard.

Get the most from your IBM* PC or XT computer system with Key Tronic's Professional KB 5151 low-profile, plug compatible keyboard . . . and get the "SHIFT" and "RETURN" keys in their proper place.

The KB 5151 offers separate cursor keys, top-row function keys with removable template, and a handy pencil and book holder ridge.

The KB 5151 features familiar typewriter key placement, Key Tronic's reliable, solid-state switch technology, LED status indicators and positive tactile feedback.

If you're purchasing a new IBM* PC, you can get it without their keyboard, and buy a Key Tronic Professional KB 5151 to enhance your system.

Suggested Retail Price: $255.00

For the retailer closest to you or information on Model KB 5151, call Toll Free 1-800-262-6006. (8 am - 3 pm Pacific Time). Warranty information may be obtained by writing to the address below.

*IBM is a registered trademark of IBM Corporation

key tronic

THE RESPONSIVE KEYBOARD COMPANY • P. O. BOX 14687 • SPOKANE, WA 99214 • USA

RETAILERS: For the Distributor in your area, call Toll Free 1-800-262-6006, Department D (7 am - 3 pm Pacific Time)

CIRCLE 289 ON READER SERVICE CARD

"Heaven Knows How I'd Keep Track of My Flock Without Infoscope."

Before we got Infoscope, I frankly didn't know what to do with our church's personal computer. Now I don't know what I'd do without it. Infoscope lets me put virtually anything in our computer, and take anything out in whatever form I need. I can see how a business could use data management like that. But my "business" is my congregation — and I never knew my congregation so well before.

Wait till you see what we get out of Infoscope ...

"Our Computer Never Did So Much Before."

I've got every church member in here. Names. Addresses. Children. Anniversaries. Pledges. Special needs. Volunteer projects. Infoscope makes it easy to enter information. If I make a mistake (no man is perfect), Infoscope suggests an alternative.

If I misspell a word, Infoscope suggests the right spelling. Politely, I might add. None of this SYNTAX ERROR business. I don't need scolding.

I Forget Anniversaries. Infoscope Doesn't.

Once I've entered the data, I just ask Infoscope to pull out all anniversaries of our members for, say, January. Before I can blink my eyes, I've got it. I remember birthdays the same way. My congregation thinks it's wonderful, the kind of memory I have. It's hard to believe that pastors used to keep all this in their heads. Or, forgive me, but maybe they didn't ...

Building Fund Pledges Here. Contributions Here.

Anytime you want to compare data, Infoscope lets you create windows.

I can see our pledge list in one window, and

contributions in another. The only thing Infoscope doesn't know is that Bill Martin is late paying his pledge because Sue has been sick. That's my department.

I Can Create a Window for Everything.

For example, Vacation Bible School. In one window, I pull out and display all the volunteer teachers. In another, I scroll through last year's students. In another, all the class projects.

And so on. I can make each window as large as I want, and put it anywhere on the screen I want.

At Last, Our Computer Performs Miracles.

It just took the right program. With Infoscope, we can enter data ... sort it

... compare it in expanding movable windows ... even pull out data from a larger data base. No software ever did so much to make a microcomputer so valuable. I swear by — well, I appreciate very much what it does for me.

infoscope™

*Infoscope operates on data in RAM, so it's 4 to 100 times faster than other information management programs. For a demonstration, see your retailer. Or, write for details

MICROSTUF®

1000 Holcomb Woods Parkway / Roswell, Georgia 30076

CIRCLE 327 ON READER SERVICE CARD

DRAWING YOUR OWN CONCLUSIONS

. . . Is Easy With The Versatile HIPAD™ DT-114 From Houston Instrument.

Enter a whole new universe of graphics, made possible by programs tailored to the HIPAD digitizer.

Exciting new applications in computer-aided drafting are now available, allowing you to create subdivision plats, machine drawings, schematics, architectural elevations and circuit-board artwork . . . with your microcomputer . . . at your desk . . . with no training as a draftsman.

Use of the HIPAD in medicine is increasing. With currently available software, physicians and dentists can prepare graphics of anatomical features for diagnosis and correction.

Artistic efforts are complemented by the HIPAD. With customized software, free-form renditions can be created quickly and precisely. Colors to fit the moment can be selected . . . and easily changed at a later time. The HIPAD provides access to the realm of high technology graphics.

The HIPAD features a full-size 11" x 11" digitizing area, and is both UL listed and FCC approved.

The Conclusions You Draw Are Clearly Correct. The HIPAD will open the door to a universe of form and color . . . and creativity.

For the name, address and phone number of your nearest representative, write Houston Instrument, P.O. Box 15720, Austin, TX 78761. Phone 512-835-0900, or 800-531-5205 if outside Texas for the name and location of your nearest representative. In Europe contact Houston Instrument, Belgium NV., Rochesterlaan 6, 8240 Gistel, Belgium. Tel. 059-27-74-45, Tlx. 846-81399.

houston instrument

Houston Instrument 35th Anniversary 1959 1984

HIPAD is a trademark of Houston Instrument

4P013A

CIRCLE 163 ON READER SERVICE CARD

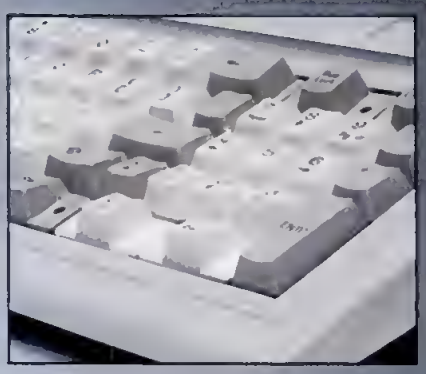
This "Finger Friendly" keyboard will make you more productive everytime you turn on your IBM PC.

Finger Friendly

Do you love your PC, but hate its keyboard? Would you like to have a quiet keyboard, with keys in the standard typewriter position? Now there is a low cost alternative to the IBM keyboard. Look at the improvements:

- ☐ **A Wider, Left Hand Shift Key/in the Standard Typewriter Position.**
- ☐ **Full Width Return Key.**
- ☐ **Lighted Indicators on CAPS LOCK and NUM LOCK Keys.**
- ☐ **A Long ENTER Key Next to Ten Key Pad for Adding Machine-Like Entry.**
- ☐ **Long Life, Capacitive Key Switches with Microprocessor Control.**
- ☐ **No Irritating Clicking Sound.**
- ☐ **Finger Homing Bumps on F, J, and 5 Key of Numeric Pad.**
- ☐ **Two Stage Key Resistance Gives Tactile Feedback Through Your Fingers, not Your Ears.**

And those are just the improvements! You don't have to give up the color matched, low profile case. Or three position height adjustment. It's the enhancement that will make you more productive everytime you turn on your PC.



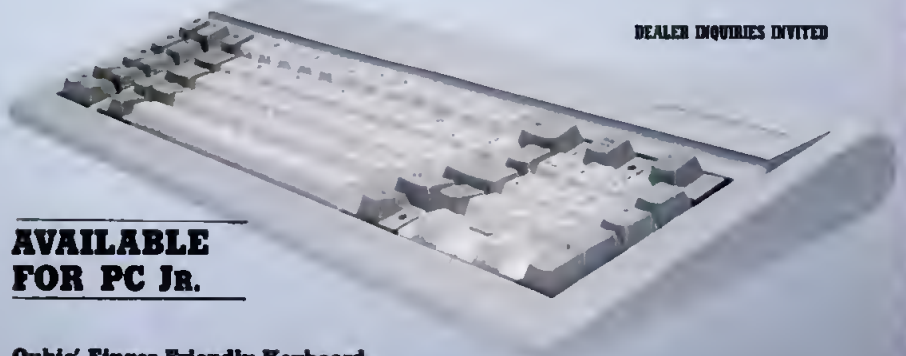
About Us

Although we sell our products direct to you, don't confuse us with mail order companies. You see, we only sell a few selected products, which we stock in depth, and service right here in our own facilities. So you get the mail order sized price, and support based on extensive experience with our products. When you call us you get informed answers.

Whether it's a Qubie' modem, standby power system, multifunction board, or keyboard—we are ready to help you before and after the sale. And if you would rather buy from a local dealer, no problem. Many dealers now stock Qubie' products, with more adding them each day.

All our products come with our 30 day satisfaction guarantee. If you are not completely satisfied you may return the keyboard for a refund, including the postage to send it back. In fact, we suggest you get a competitor to make the same offer, buy both products, and return the one you don't like. We know which one you'll keep.

DEALER INQUIRIES INVITED



AVAILABLE FOR PC JR.

Qubie' Finger Friendly Keyboard,
with 1 year warranty.
Part No EE5150 **$169**

IBM is a trademark of International Business Machines Corporation

Order Today, Shipped Tomorrow!

Price includes UPS surface freight and insurance. Add $7.50 for two day air service. For fastest delivery send certified check or credit card. Personal checks take 18 days to clear. Calif. residents add 6% sales tax. Corporations and Institutions call for purchase order details.

(800) 821-4479
Toll Free Outside California

(805) 987-9741
Inside California

QUBIE'

4809 Calle Alto
Camarillo, Ca. 93010

Tempo House, 15 Falcon Road,
London SW11 2PH, United Kingdom

DATAEASE™

"DATAEASE is a true winner — on technical merit alone, DATAEASE would put dBASE II out of business."

Business Computer Systems
April 1984

DATAEASE is the most complete information management system available. While literally hundreds of systems claim to offer simple solutions to complex business information needs, rave reviews from our clients, application developers and the media confirm DATAEASE as the **only** product which delivers on this promise.

*"DATAEASE received the highest 'Overall Evaluation' rating of the five **fully relational** programs tested by Software Digest in its report on 20 IBM PC database and file management programs appearing in the March 1984 issue of **The Ratings Newsletter**."*

The Ratings Newsletter
Software Digest, 1984

Thousands of business clients worldwide — large and small — say DATAEASE increases productivity. And that is why, in a few short months, DATAEASE has become a top-seller within the Fortune 500 companies.

"What took five man-months of development with dBASE II, was accomplished in two weeks with DATAEASE."

Bob Scavullo, President
Noesis Computing Company

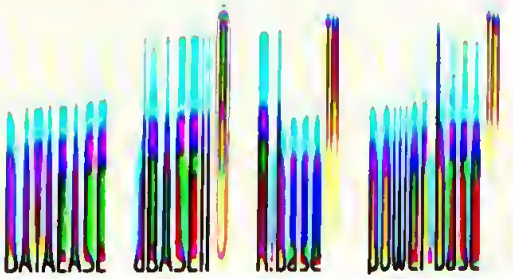
"DATAEASE enabled us to change files, records and reports with no fear of losing data — I can't begin to put a value on that."

Peter J. Newcombe, Corp. MIS Manager
General Defense Corporation

Here are some of the features that make DATAEASE the best buy on the market today:

- Layout your forms on the screen.
- Connect any number of files in seconds.
- Access functions with single keystrokes.
- Modify records and design custom reports

copyright material



		DATAEASE	dBASE II	R:BASE	POWER BASE
Features	Menu driven with built-in commands	•			•
	Full application development functions	•	•		
	Applications can be modified by user	•			
	Menus can be defined by user	•			
	Over 200 fields/record & characters/field	•		•	
	More than 8 indices per file	•			
	More than 16 concurrent open files	•			
Data Entry	Full screen editing for form creation	•		•	•
	Selection from predefined choices	•			
	Valid options always displayed	•			
	Table look-up, dollar and date fields	•		•	•
	Checks for duplicate records	•		•	
	Form modification with auto file update	•			•
Reports & Queries	Query selection through English prompts	•			
	Multiple field sort	•		•	
	Create form letters and mailing labels	•			
	Update multiple files concurrently	•		•	
	Update data between files	•	•		
Interfaces	Read/write both DIF and ASCII	•		•	
	Menu integration with 1-2-3/MultiMate, etc.	•			

- Sort, group and calculate statistical information.
- Access up to 32 files concurrently.
- Interchange data with popular programs.
- Import and export data from mainframe databases.
- Define menus to customize your application flow.

"DATAEASE requires no training, and very little support . . . that keeps my customers happy, and coming back."

Nancy Lubecker, Assistant Manager
Softwaire Centre International

DATAEASE Demonstration Diskette

Check one: ☐ IBM PC ☐ Wang ☐ DEC ☐ TI

☐ Check attached for $10. Send complete information package and DATAEASE Demonstration Diskette

☐ Send information package

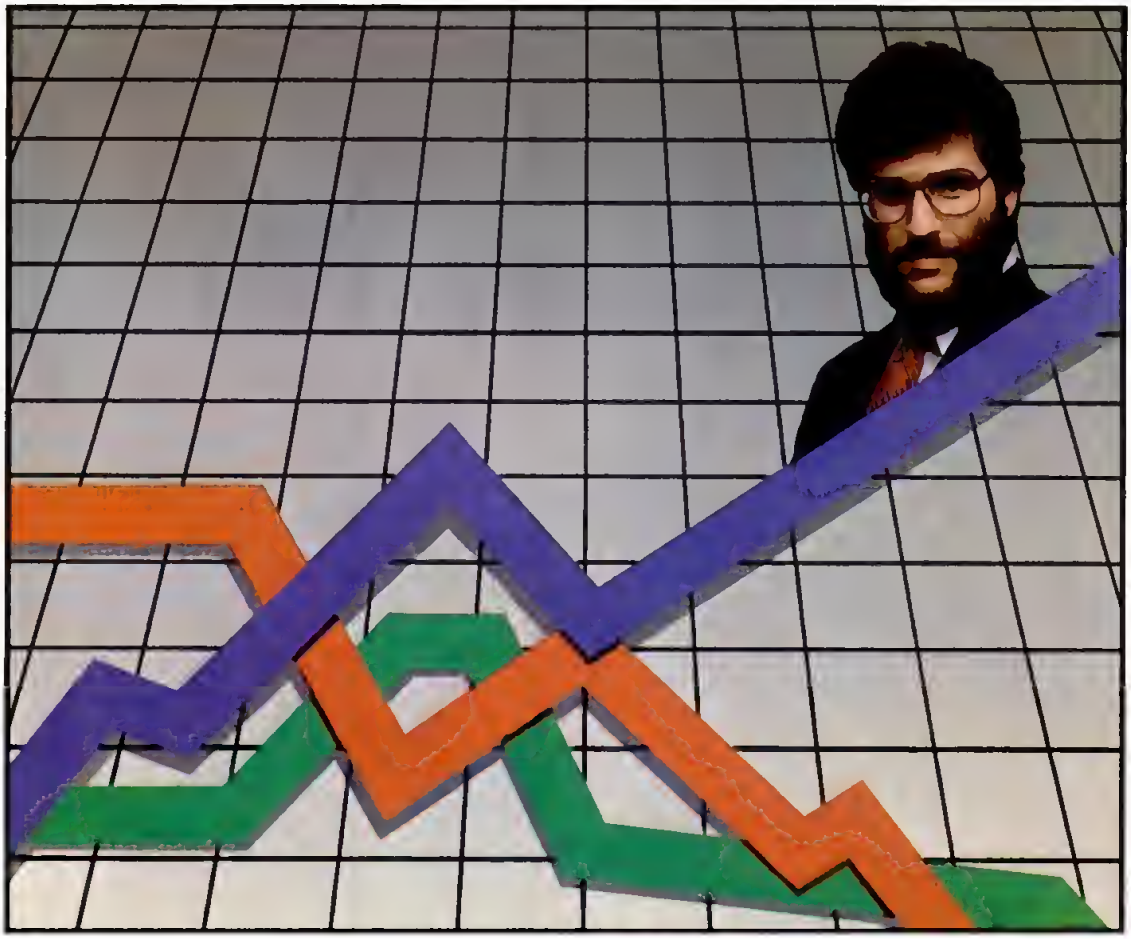
Name _____

Title _____

Company _____

Address _____

City _____ State _____ Zip _____



There's a good reason why Adam B. Green's on top.

He picks the winners. First dBASE II, then 1-2-3, and now Framework by Ashton-Tate. There is no need to wait any longer to buy the ultimate in software. Framework is here. An order of magnitude advance over integrated programs and windows. A truly three-dimensional design. Infinite logical hierarchies of information. Word processing, outlining, database, spreadsheet, graphics, DOS access and a programming language make Framework the most elegant program yet conceived.

He makes the winners work for you. User guides that set the standards. Seminars to make the programs understandable. Videotapes that bring it home to you. Adam B. Green doesn't just pick the winners, he teaches you how to use them.

SoftwareBanc

661 Massachusetts Avenue, Arlington, MA 02174
(800) 451-2502 • (617) 641-1235

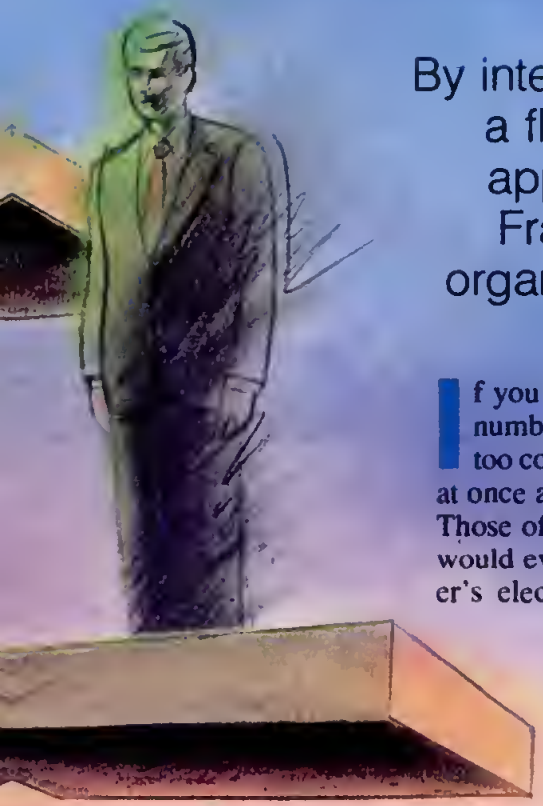
FRAMEWORK and SYMPHONY Face Off

With *dBASE II* and Lotus' *1-2-3,* Ashton-Tate and Lotus Development Corporation have established themselves as the titans of databases and spreadsheets. Now, these software virtuosos are squaring off in the new, expanded arena of full-function integrated software. Will *Framework* build the foundation for Ashton-Tate's software dominance or will *Symphony* drown out its integrated software challenger?

Photography: Dennis Chalkin

Framework: An Outline For Thought

By integrating an outlining function into a flexible package of windowed applications, Ashton-Tate's new Framework gives idea workers organizing power that goes beyond spreadsheets.



If you work with ideas that can't always be expressed in numbers, you may have found word processing software too constraining when you're working on several projects at once and you need to constantly reshuffle your thoughts. Those of you who have wondered whether "word people" would ever get their own equivalent of the number cruncher's electronic spreadsheet, take heart. Ashton-Tate may

Illustration Ivan Powell

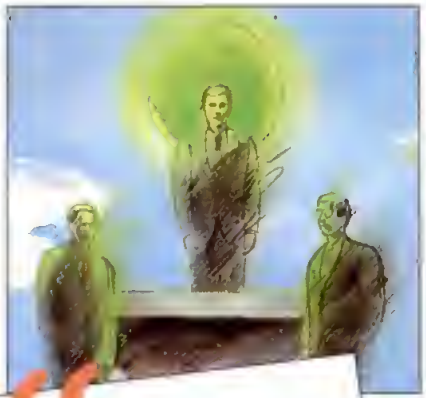
have some software for you.

Framework, a program written in assembly language to maximize its performance on the IBM PC, can best be described as an idea processor. It includes an outlining feature similar to that in *Thinktank*, a well-received software package by Living Videotext, Inc., but *Framework* goes well beyond *Thinktank* with closely integrated additional functions and a window and menu system reminiscent of those in the Xerox Star or Apple Lisa and Macintosh machines. This resemblance is no coincidence. The principal author, Robert M. Carr, is an alumnus of the Xerox PARC laboratories, the seedbed for many recent innovations in software engineering. He also participated in the development of the first major integrated software system for the PC, *Context MBA*. Carr and Martin Mazner, his partner in Forefront Corporation, the developer of *Framework*, have joined forces with Ashton-Tate, the software marketing giant. They hope to reach out to a new generation of software users while retaining the allegiance of the application developers who have done much to promote Ashton-Tate's *dBASE II*.

Although disarmingly simple to use, *Framework* is the kind of program that inspires small armies of interpreters to fully explore its inner reaches. The version I reviewed bore many traces of its earlier existence in the laboratory under the codename Fred and was still a work-in-progress, an emerging gem whose sparkle was occasionally dimmed by a few rough edges. This article, therefore, is more a preview than the full critical appraisal that the final product will eventually deserve.

Idea Classification

Some philosophers of science have suggested that classification—that instinct to label, pigeonhole, and hierarchically arrange things—is the most fundamental achievement of human thought. Classification is crucial to the work of astronomers, microbiologists, cookbook writers, and librarians who codify and outline specialized knowledge. Even if you have forgotten the outlining techniques you learned in a traditional English class, you probably still try to arrange your shopping lists in rough correspondence to the route you intend to follow through the grocery store. With its outlining facilities, *Framework* tries to build on this instinctive way of arranging ideas.



> "*Framework* is a breakthrough product, like *VisiCalc*, *dBASE II*, and *WordStar*. It sets the pace of the state of the art. Unless you've seen it, you can't describe it; the words just aren't there. All other products are measured against it."
>
> **ADAM GREEN**
> noted *dBASE II* teacher

Unlike Lotus' *Symphony* and some other "second generation" integrated software, *Framework* represents a personal vision of how people process and create information, rather than the result of careful market research and feedback on an earlier product. It therefore has the advantages (and disadvantages) of a fresh start; it has no need to maintain compatibility with data or command structures from a previous success, as must *Symphony*. Forefront's connection with Ashton-Tate and *Framework*'s need to communicate with *dBASE II* is clearly a rather late development. (No *dBASE II* interface is documented or available in the review version. Writing one was no doubt complicated by the recent release of *dBASE III*, which is not directly compatible with *dBASE II*.)

First impressions of a new software package often can make or break it in the retail market. To my jaundiced eye, accustomed to less-than-stellar velocities from the PC's Intel 8088 chip with a floppy disk and to particularly pokey performance from multifunction software, the first thing that stands out is *Framework*'s speed. Its speed may not bowl you over, but despite its 200-odd K of code, *Framework* loads fast—faster, for example, than Lotus' *1-2-3* with its access system, and, for that matter, faster than any of the current applications on the Apple Macintosh. This speed is a genuine advantage in a program designed to serve as host for a variety of applications. Once loaded into memory, the review version needed no overlay files, which meant that only saving and restoring your data would require access to the disk. Although a future 256K version of the program will apparently sacrifice some speed for greater data capacity by using overlay files, hard-core users are likely to purchase a lot of memory expansion boards to avoid slowing it down.

Frames on the Desktop

Framework's real pyrotechnics begin after you have reached its "desktop." Whether you are using a color or monochrome monitor, you will soon see win-

dows—or "frames"—opening and closing at speeds that you might have expected only from a 16/32-bit chip like the Motorola 68000. Yes, *Framework* does do windows, and it does them rather sensibly, too. Any idea, document, project, spreadsheet, simple data file, or graph can become a window. (On a monochrome screen, character graphics similar to those in *Jack2* are used; with a graphics board, italics and other bit-mapped effects become possible.) The really special trick is that each item that can appear in a window can also lie inactive in a "tray" in the lower right-hand corner of the screen or be represented as a line item in an outline.

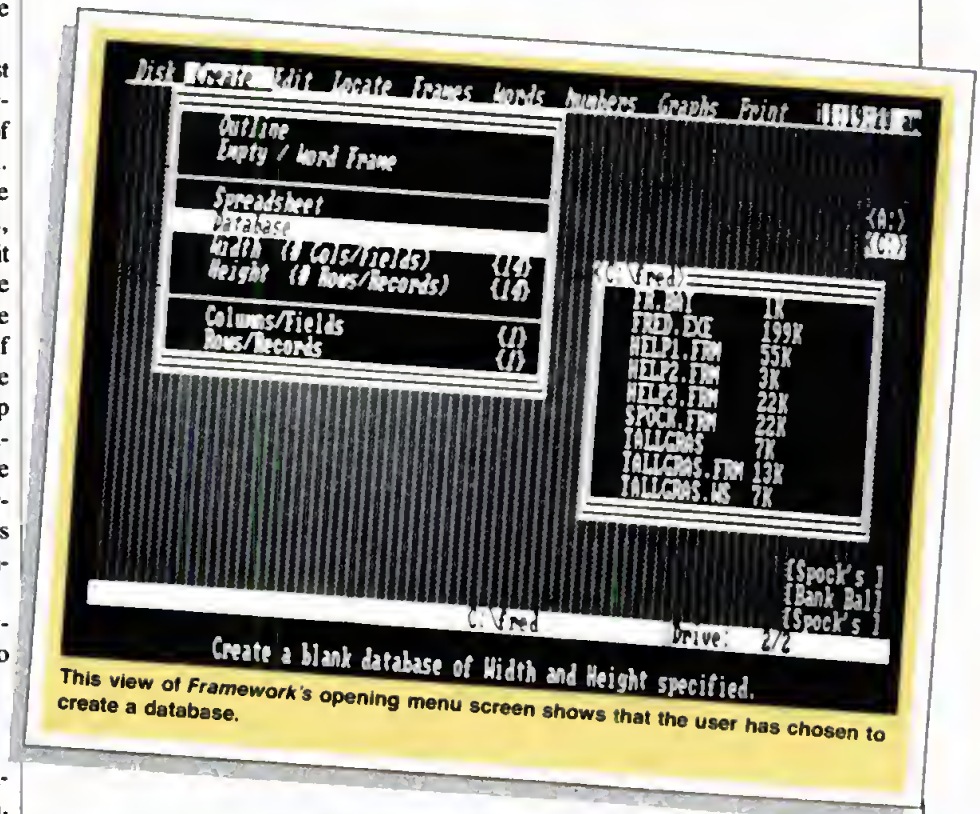
After booting up the system, you first see a nearly empty screen—or as *Framework* calls it, a "desktop"—with a row of menu choices at the top of the screen. These choices include such common-sense functions as Create, Edit, Locate, Graphs, and Print, as well as a few that require a bit more exploration. To the right of these selections is a digital clock that reports the system time. It can be set automatically if you have a clock/calendar board. In the upper right-hand corner of the desktop area itself, you see symbols for the available disk drives, and at the bottom of the screen, some prompts for the initial functions you will want to use, as well as status indicators for the CapsLock and NumLock keys.

Framework tries to make even the newest user feel at home. It prompts you to either create a new document, fetch an existing document from a disk drive, or press the F1 key for further help. Although the help functions were incomplete in the review version of the system, they are intended to be "context sensitive," providing relevant information about whatever options are currently available. *Framework* also has a special form of help for each special function or cursor movement key; to find out what a key does once you are in the help system, you just press it. Additional help is promised in the form of a tutorial disk.

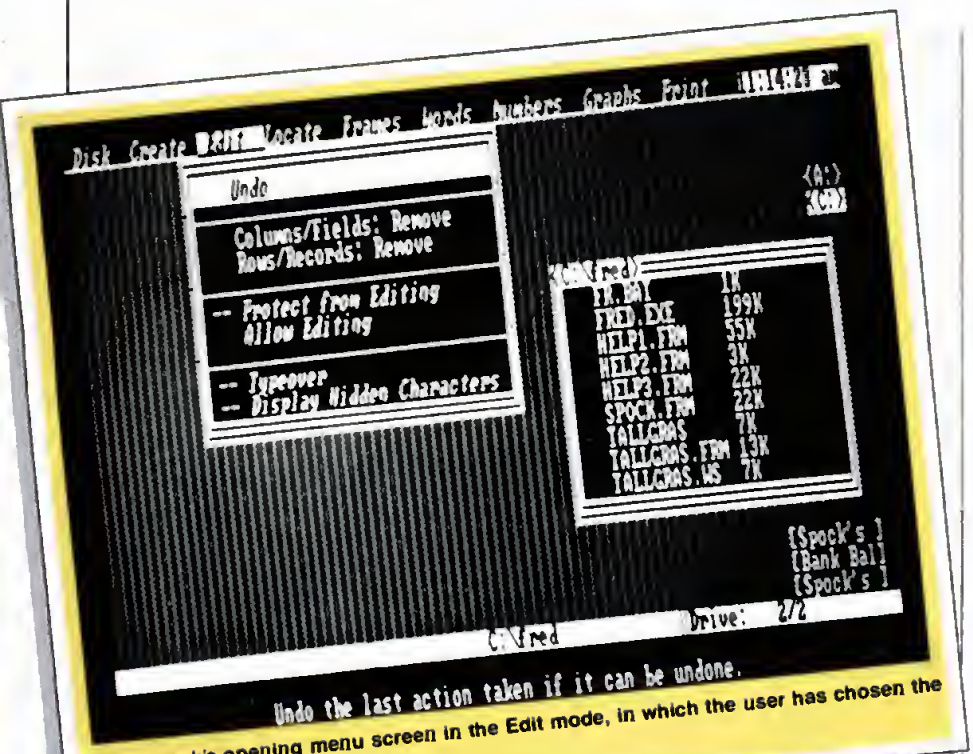
The way *Framework* uses the PC keyboard deserves special mention. "Myophobes" who can't bear the thought of sharing their desks with a mouse will be glad to know that Carr and his associates have optimized the use of most PC keys. Users of *1-2-3* will be happy to find that *Framework* uses many keys in familiar ways. One major difference, which at first seems eccentric, is that the Ins key (rather than the slash key as with *VisiCalc*) is used to commence a menu-based command sequence. Because *Framework* is normally in an insert mode (an overwrite mode is available), the Ins key was free for this use. The key is also quite handy. Pressing Ins will normally take you to the "pull-down" menu and function you were last using. For other menu functions, a two-key control sequence speeds access for experienced users. For example, the Ctrl-E-U key combination takes you to the Edit menu and selects the Undo function. The ten standard function keys offer consistent and powerful ways of controlling the size and shape of windows; selecting, moving, and copying data; and switching between outline and window views of items on the desktop.

Working with Applications

Framework initially assumes you may want to work with an existing document. If you do, or if you want to check the contents of a disk drive, you can simply press the Enter key to open the directory of the drive highlighted on the desktop. A partial directory listing quickly appears in a frame on the screen. To work with the material in a frame (including the files on a disk), you press the plus-sign (+) key on the numeric pad. Once inside the directory frame, you can scroll through the alphabetically arranged directory by using the cursor movement keys, including PgUp and PgDn. When a file you wish to work



This view of *Framework*'s opening menu screen shows that the user has chosen to create a database.



Framework's opening menu screen in the Edit mode, in which the user has chosen the Undo function.

with is highlighted, pressing the Enter key will immediately bring it into a new frame on the desktop.

Creating a new outline, text frame, spreadsheet or data file is almost as easy using the Create menu, which you "pull down" from the top of the screen by pressing the Ins key. Selecting the Outline function opens a frame containing three major section headings, each with three subheadings. All are ready to receive labels and potentially can be treated as separate frames. With a bit of practice, you can add new sections, delete unnecessary ones, and resequence any sections you like. You do not necessarily need to use the Outline function initially, however, since you can later establish "containing frames" in which you can reorder or bring together several independently created documents or frames.

The cursor movement keys, the Ctrl key, the function keys, and the Edit, Locate, and Words menus greatly help you in working with text, whether it is in a standard text frame or in spreadsheets and other applications. Most basic functions of any good word processing program are easily accessible, although some fancy formatting, such as subscripts and superscripts, may not be. With a graphics board, on-screen boldfacing, underscores, and italics appear with selected text at impressive speed. *WordStar* users in particular should appreciate that paragraph reformatting is completely automatic, and simple justification and centering are available for each paragraph or for entire documents. However, text editing isn't much use if data can't be brought in and printed out. It was indeed possible for me to read in a standard ASCII-formatted document and, with a little effort, to totally reformat and print it on an Epson FX-80 printer with boldface, underscoring, and even bold, underscored italics.

> "*Framework* is Ashton-Tate's answer to the question, "If you and your PC were stranded on a desert island, what one software package would you want to have with you?" *Framework* has, to date, come closer than any other package to being all things to all people."
>
> **BILL MACHRONE**
> **editor, *PC Magazine***

Although *Framework* seems particularly well suited to wordsmiths, it's no slouch when it comes to working with numbers. All the major functions familiar to users of other advanced spreadsheets are there, including date arithmetic, horizontal and vertical table lookup, and internal rate of return. The preliminary documentation includes useful examples for many functions, such as a very clear explanation of how standard deviation measures might be useful in a business application.

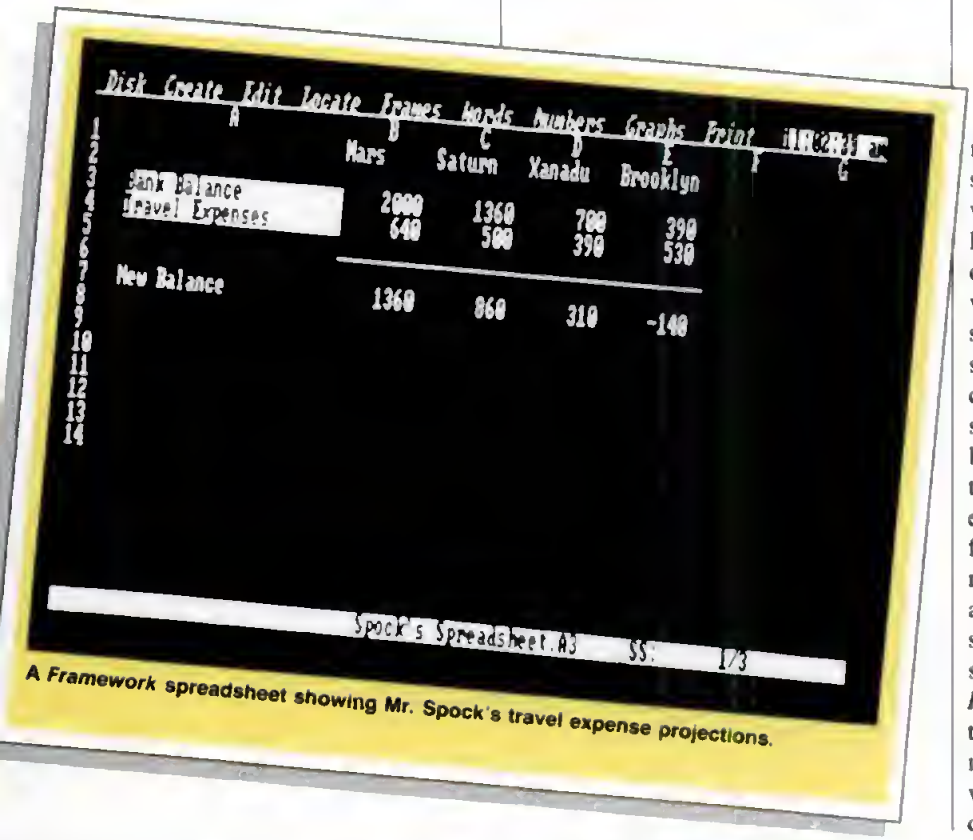
If you are a heavy spreadsheet user, you may be irritated by the fact that you must allocate the number of rows and columns of *Framework*'s spreadsheet (and data file) frames before you begin. This preallocation is probably useful when you plan to merge numbers with text, and it helps to conserve memory, but it does create extra difficulty in setting up a sheet. *Framework*'s row and column nomenclature is essentially like the classic *VisiCalc* and *1-2-3* reference form, and the mildly irritating shifted "at" sign (@) is also used to introduce functions. The Enter and Tab keys permit quick movement to an

adjoining cell after you have entered data. Ranges can be named, but apparently they must always be based on row or column headings, a system not as flexible as designating any rectangular area. You indicate ranges of cells by a colon separator, as in *Multiplan*. While this method can be a bit annoying, since a colon is also a shifted character, you can enter ranges within formulas by the cursor pointing method. A particularly useful facet of the *Framework* cell reference system is that each coordinate also includes the frame's name. This system makes it possible to refer directly to cells in other spreadsheets and thereby link them. You can sort rows without entering the Database mode—one of several potentially hazardous actions that can be reversed by the Edit menu's UNDO command.

Although graphics functions were not well documented in the *Framework* review version, they have the potential to be quite flexible. They can be both programmed as functions and produced with little effort through use of the Graphics menu. You can derive legends and titles almost automatically from an underlying range you select within a spreadsheet. Although some types of graphs did not yet appear to be functional in the review version, those that were I found easy to create and modify. Ashton-Tate also has promised facilities to automatically redraw graphs when the associated data are changed. All graphics screens can be printed through the use of the DOS 2.x GRAPHICS utility or the public-domain Graftrax program with an Epson printer. The Print menu suggests that *Framework* ultimately will support several plotters.

Framework's Database function is definitely not a *dBASE II* killer. (Ashton-Tate is not about to sacrifice most of its current revenue.) Although fundamentally very spreadsheet-like—you normally see it with rows representing fields and column headings as field names—a *Framework* database can also be presented as forms in which each record occupies a separate screen. It will temporarily filter records by standard Boolean selection criteria, or you can make the filtering semipermanent by storing the criteria on the border of a database frame. The preliminary documentation warns you of dire consequences if you exceed available memory by combining files, so clearly you should maintain only rather small files. No indexing of files is available, but single-field, in-memory sorts can be done in this mode, as with spreadsheets. Unless the final version of *Framework* has some report and form-letter generation facilities that don't currently meet the eye, transferring data to *dBASE II* will be essential for most "real world" data management tasks.

> "I'm extremely impressed by *Framework* and *Symphony*. Both products are pointing in the right direction, but *Framework* will be a superior product and a greater success. *Symphony* is based on slinging numbers around; *Framework* is oriented to words and ideas. Most people work with ideas."
>
> **PETER NORTON**
> **noted IBM PC author and software developer**



A Framework spreadsheet showing Mr. Spock's travel expense projections.

All Things to All People?

Even a brief overview of *Framework* would be incomplete without mentioning its macros and programming facilities. Like *1-2-3*, *Framework* allows you to program the Alt-letter key combinations with either text or command functions. Altogether, about 140 functions are available in the spreadsheet and in other modes. In addition to very complete date and time functions, *Framework* offers ways to perform international currency formatting and several other unusual operations. Some gaps, at least in the review version, will also be evident to *dBASE II* users. For instance, *Framework* cannot automatically convert keystrokes to upper case, so a programmer developing an application must make it test separately for upper- and lower-case responses to user prompts. On the other hand, *Framework* has handy facilities for presenting prompts to users at the bottom of a screen, timing how long someone takes to press a key, checking which key it is, or even redefining keys. Keystrokes can also be captured to create new macros so that simple programming can be opened up to nonprogrammers. A whole world of programmer's delights, many still undocumented, remains to be explored in *Framework*.

When *Framework*'s built-in capabilities are not enough to meet your needs, you can create a DOS Access text window. In this window, any program or DOS command that could normally be reached from the operating system drive prompt can theoretically be run. I found it quite easy, for instance, to use the CHKDSK utility to check the available disk and memory space, although it would be better still if these vital indicators were made an integral part of *Framework*. (Although even in my review version, the program's error handling was quite good, I was forced to reset the computer a couple of times when the program froze up, at least once from an "out of memory" error.) Running other major programs from within *Framework* will clearly be possible, although I encountered a few quirks when I tried working with *dBASE II*, *1-2-3*, and *WordStar* through a DOS Access window. In each case, however, *Framework* came back, apparently unscathed from these encounters with the competition, when at the DOS level I typed the magic signal EXIT. The DOS Access window is important because it compensates for *Framework*'s lack of any data communication functions.

Despite the package's many wonders, Ashton-Tate and its competitors still must confront the question of who will buy and use *Framework*. Technically minded computer buffs will be attracted to it as a tour de force in software engineering for the current IBM PC architecture and perhaps as a "software lathe" for vertical market applications development. Old hands at producing add-on products for *dBASE II*, such as Fox and Geller, have already announced that they will support *Framework* in similar fashion. But the current primary *1-2-3* spreadsheet and *dBASE II* file management markets may

> "*Framework* represents the first time a software leader has taken deliberate aim at another software leader's territory. If anybody can pull off this coup, it's Ashton-Tate. But it's possible that the end result of the *Framework/Symphony* face-off won't be conquest, but an expansion of the market to include both companies. *Framework* may draw an entirely new population of word-oriented computer users into the integrated software fold, without wiping out Lotus' hold on dedicated spreadsheeters."
>
> **MIKE EDELHART**
> **executive editor,**
> ***PC Magazine***

> "The companies' marketing strategies and distribution channels for the two products are quite different because the products are aimed at different audiences. *Symphony* is number-oriented while *Framework* is more oriented to word processing. But there is a gray area in the middle where they'll be fighting."
>
> **ESTHER DYSON**
> **editor, *RELease 1.0***

be more difficult to convince. Perhaps professionals rather than managerial personnel will be the largest single market, although many organizations and individuals will at least want to experiment with *Framework*'s special offerings.

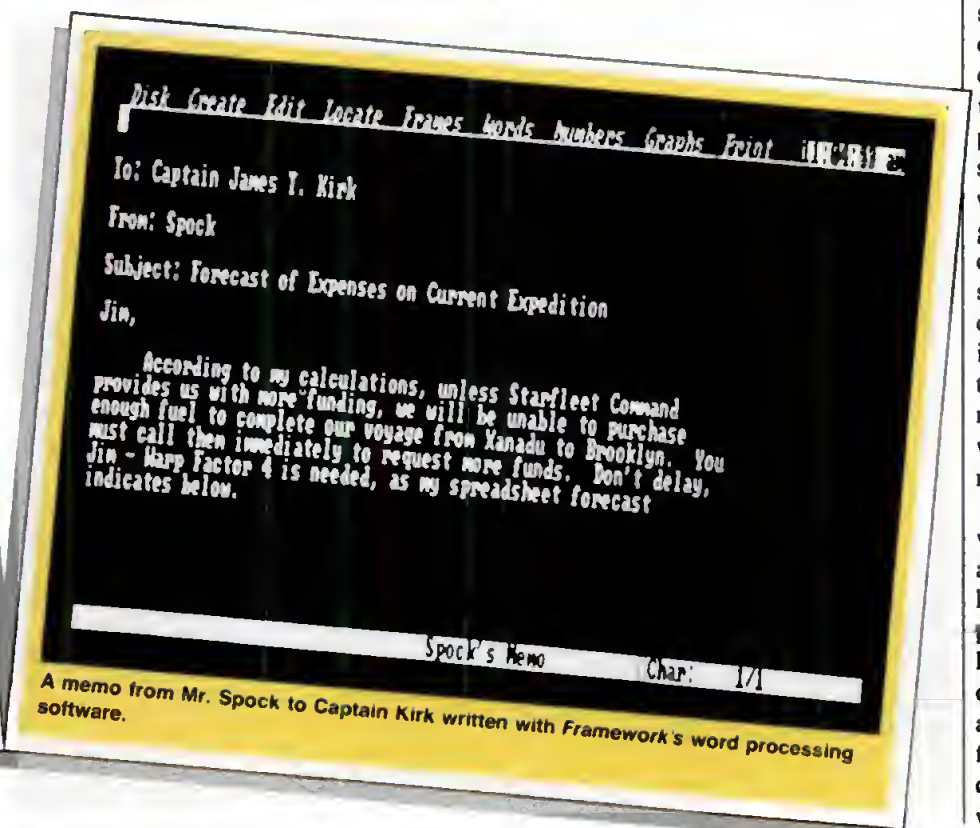
Framework's approach to accomplishing intellectual work may not really correspond to the way most people normally operate—but it may well come close to the way composition teachers taught them. *Framework* isn't likely to replace all dedicated word processing programs for secretaries, text editors for programmers, or spreadsheets for financial experts, but if I had to choose a single piece of software for professional use, I might well choose *Framework*.

I suspect the ability to run *Framework* will become a new standard test of PC compatibility. By maximizing the powers of the Intel 8088 chip, *Framework* helps to postpone the PC's day of reckoning with more powerful processors and will put a significant dent, for a while, in the appeal of machines that use other processors.

Framework is unlikely to knock *Symphony* out of the ring, even if it turns out to be technically superior. Lotus has a well-earned preeminence among spreadsheet aficionados, and *Symphony* may be better suited to large organizations with an elaborate division of labor and complex financial reporting requirements. But *Framework* will create serious problems for the producers of other, less-integrated and slower "productivity" application software, and for standalone windowing programs. Only by tying window capabilities closely to the operating system (as Microsoft and IBM are doing), by adding concurrency and multi-user capacity (as Digital Research has done), or by bringing together applications with a common command structure (as *Framework* does) will window programs have much to offer to new users.

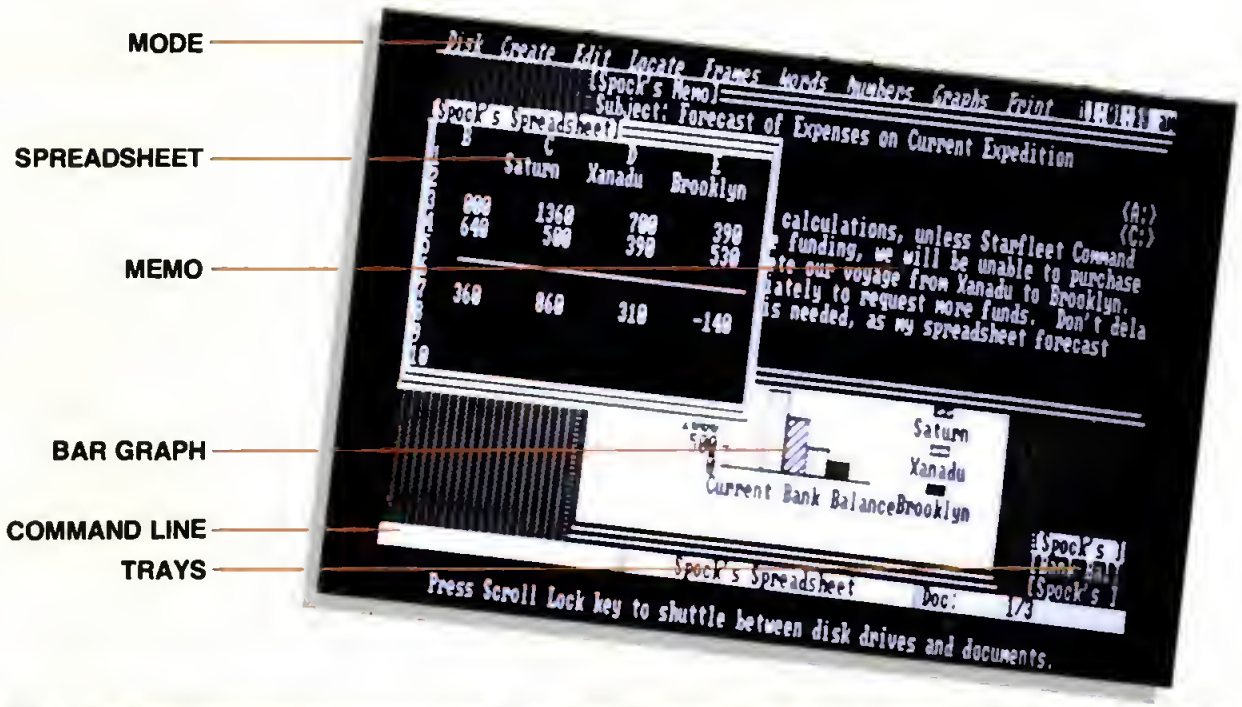
Much of today's software makes a wrenching trade-off between ease of use and power. *Framework*, on the other hand, seems to offer both. The marketplace will ultimately determine whether Robert Carr's idea-processing paradigm is one that large numbers of purchasers will accept, but at least on technical merit and for its genuine innovation, *Framework* deserves strong consideration for the Software-of-the-Year award. ■

> "*Framework* is more ambitious and advanced than *Symphony*. It's like the Wankel engine, technologically marvelous but commercially untested. The real battle may well take place among the system integrators, who will find the Fred language extremely powerful and easier to use than Lotus macros."
>
>
>
> **SPENCER F. KATT**
> **columnist, *PC Week***



A memo from Mr. Spock to Captain Kirk written with *Framework*'s word processing software.

F R A M E W O R K



Ashton-Tate
10150 W. Jefferson Blvd.
Culver City, CA 90230
(213) 204-5570
List Price: $695
Exchange Option: The company is considering a policy of exchanging *Framework* for *1-2-3*.
Requires: Tested version requires 384K RAM; updated version will require 256K.
Memory Considerations: The entire program must be loaded into memory. Database is also held entirely in memory. *Framework* and DOS take up 170K.
Maximum Number of Cells: Up to 32,000, limited only by RAM.
Maximum Record Length: Up to 32,000 bytes, limited by RAM.
Maximum Number of Records in Database: Up to 32,000, limited only by RAM or disk capacity.
Maximum File Length: Up to 32,000 bytes, limited by RAM.

FUNCTIONS

Word processing
- Does on-screen boldface, underscore, and italics with graphics board.
- Automatic paragraph reformatting

Spreadsheet
- Each cell coordinate includes the frame's name.
- Sorting of rows can be done in spreadsheet mode.
- Size must be preallocated.

Database
- Analytic tool, not a replacement for *dBASE II* or *III*.
- Can view database in spreadsheet format or with one record per screen.
- Up to 32,000 sort fields, limited only by RAM.
- Filtering criteria can be stored on border of database frame.
- Size must be preallocated.

Graphics
- Bar graphs
- Stacked bar graphs
- *xy* graphs
- Line charts
- Pie charts
- Exploded pie charts
- Does character graphics on monochrome screen, bit-mapped effects with graphics board.

Telecommunications
- Has full menu-driven asynchronous telecommunications capability.

ADDITIONAL FUNCTIONS

System-wide Utilities
- You can access all capabilities from any part of the package. A menu comes down from all parts of the package.

Language Capabilities
- 140 functions available
- May program Alt-letter keys with text or commands

Outline Format
- Allows easy rearrangement of frames.

Import/Export
- Imports standard ASCII; company says that released version will also export standard ASCII.
- Company says that released version will import/export *dBASE II* and *III* files.

ASSISTANCE

Help
- Obtain by pressing F1
- Company says Help will be context sensitive in released version.

Tutorial
- Company says tutorial disk will be available in released version.

USER INTERFACE FORMATS

- Menu choices presented at top of screen; can bypass menu levels.
- Prompts along bottom of screen advise on options.
- Frames are windows.

THE SHARED INFORMATION AREA

Name: Desktop
- Initial Function: Get blank desktop with symbols for disk drive. You select and scroll through a disk drive. Files are listed in alphabetical order. You can point to a name on the directory, press Enter, and the file appears on the screen. There is a Create menu for making new files.

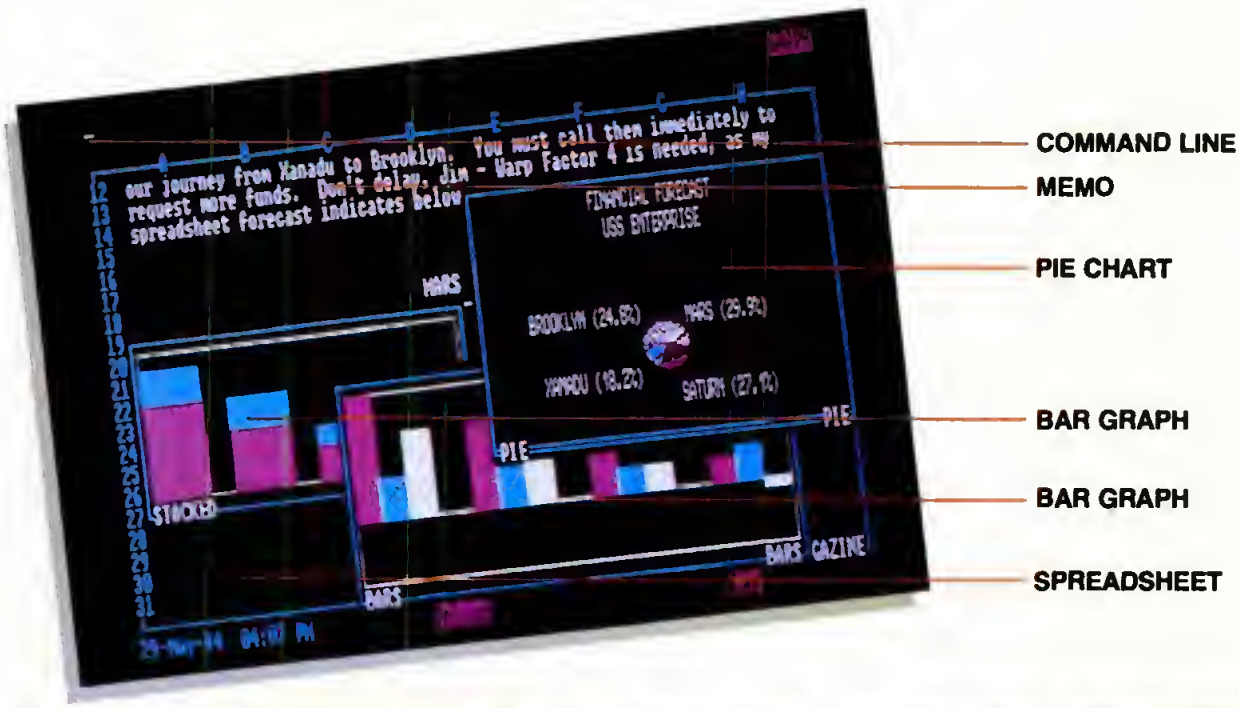
COMBINING FUNCTIONS ON SCREEN

- Frames are concatenated.
- Graphs are on the screen.

COMBINING FUNCTIONS IN PRINT

- You can combine all the functions both on the screen and on printouts. You can mix and print text and graphics.

S Y M P H O N Y



PC FACT FILE

Lotus Development Corporation
161 First St.
Cambridge, MA 02142
(617) 492-7171
List Price: $695
Exchange Option: $200 exchange option for licensed *1-2-3* owners.
Requires: 320K RAM, two disk drives or one drive and hard disk, monochrome or color monitor.
Memory Considerations: Entire worksheet must be in memory.
Maximum Number of Cells: 256 columns by 8,192 rows, but less available owing to memory constraints.
Maximum Record Length: 256 fields, each containing 240 characters.
Maximum Number of Records in Database: Up to 8,191, subject to memory constraints.
Maximum File Length: Depends on memory capacity of the computer and size of the file. Maximum file length is total memory minus 260K to 270K RAM.

FUNCTIONS

Word processing
- Menu oriented
- Indicates current page and line.
- Highlights text in Copy, Move, or Erase.

Spreadsheet
- Incorporates *1-2-3* spreadsheet capabilities.
- 70 formula functions perform automatic computations.
- Character string functions to dissect or concatenate strings.

Database
- Forms oriented
- Up to three sort keys
- Query using special form

Graphics
- Line charts
- Bar charts
- Stacked bar charts
- Pie charts
- Exploded pie charts
- *xy* chart
- High-low-close-open stock charts

Telecommunications
- Requires modem and asynchronous adapter.
- Transmits *Symphony* worksheets.
- Uses on-line database and mail services.

ADDITIONAL FUNCTIONS

Services menu
- Commands common to all environments
- Stores, retrieves, and lists files.
- Prints portions of worksheet.
- Creates windows.

Command Language
- Incorporates *1-2-3*'s macro capability to mimic keystrokes.
- Procedural language
- Use to develop own menus.

Import/Export
- ASCII, *dBase II*, *VisiCalc*, and DIF formats.

ASSISTANCE

Help
- F1 key
- Context sensitive

Tutorial
- On disk, 16 lessons, 15 minutes each.
- Introductory level

THE SHARED INFORMATION AREA

Name: Worksheet
Initial Screen: Spreadsheet

COMBINING FUNCTIONS ON SCREEN

- Can combine data in any function's formats in one document with following limitations:
- Using monochrome display adapter, cannot display graphics;
- Using color adapter, Hercules board, or Compaq, can display text and monochrome graphics simultaneously;
- Using special supported graphics board, can display text and color graphs simultaneously.

COMBINING FUNCTIONS IN PRINT

- Cannot print text and graphs simultaneously.

USER INTERFACE FORMATS

- Menus used throughout.
- 20 function key combinations, plastic overlay provided.
- Windows are unlimited in number but may vary in shape, position, and extent of overlay.

Symphony: A Community Of Information

Lotus has added word processing and telecommunications to 1-2-3's functions and come up with an integrated masterpiece that emphasizes the sharing of data among five applications.

Napoleon would have liked *Symphony*, an integrated package with enough capabilities to satisfy anyone with an intense craving for power. Lotus Development Corporation has again ushered in a new generation of integrated software. *Symphony's* power and flexibility, *1-2-3*'s massive and loyal following, and a multimillion dollar advertising campaign will ensure Lotus a strong position in this year's race for software supremacy.

(continued)

Illustration: Ivan Powell

Symphony touches upon every important microcomputer application. In many ways it rounds out the capabilities of *1-2-3*, but it also includes a multitude of new features.

Some of the most powerful and complicated ideas in software design originate from plain common sense. The electronic spreadsheet, for example, was born out of the simple recognition that a microcomputer could handily answer the storage and calculation requirements of accounting analyses. The new generation of integrated packages has also evolved from a simple but powerful idea: Data is data. No matter how you use it—as a spreadsheet, a database, or a graph—it is still merely a collection of characters and numbers that you can manipulate and view.

The Worksheet

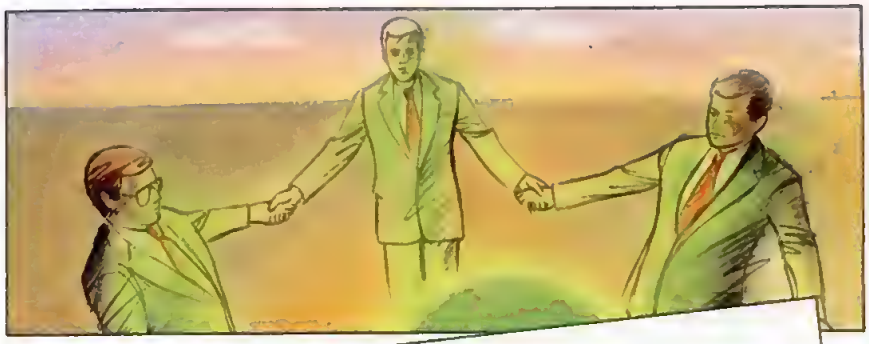
Lotus made this concept the basis of integration. One of the most important features of *Symphony* is that all data is stored in a common area, called a worksheet, that is shared by the five *Symphony* environments: spreadsheet, word processing, database management, graphics, and telecommunication.

Think of the worksheet as a grid of rows and columns. On this grid you may store the letters and numbers that comprise, for example, your 10-year revenue forecast. But because the word processing environment shares this worksheet grid with the spreadsheet environment, your word processed budget report has access to the very same numbers that comprise your revenue forecast. Therefore, you may insert a table in the budget report that reflects a number from the revenue forecast or even embed the entire spreadsheet in the report. Change an assumption in the spreadsheet, and the text of the report will reflect the new spreadsheet results. The common storage area extends this type of integration to all five work environments.

When you load *Symphony* for the first time, the spreadsheet environment commandeers the screen. To issue commands in any of the environments, you select an option from a menu—a concept implemented and popularized by *1-2-3*. In each environment two command menus are available. You can invoke a menu specific to the environment you're currently in with the F10 key. The other menu, which is called the Services menu, appears when you press the F9 key and consists of commands that are common to all environments.

The Services menu allows you to store, retrieve, and list files; print segments of the worksheet; affect the structure of the display; and determine the amount of available memory and various other settings. By grouping these common commands into the Services menu, Lotus endowed *Symphony* with a uniform command structure.

You can move from the spreadsheet to another environment through the Services menu, but this requires a number of command selections. A quicker way is to use the function keys. *Symphony* makes use of all 10 function keys on the PC and doubles them by assigning additional functions to



> "*Symphony* will be like *1-2-3*, a standard by which everything else will be measured. It has more features and closely coupled communications capabilities, and its spreadsheet is more powerful. *Symphony* has more functions than *Framework* and greater communications capabilities. *Symphony* can send, with one keystroke, a record or file to or from another location. *1-2-3* is currently the standard product in every profession; replacing it will be difficult. But as their needs increase, first-generation *1-2-3* users will upgrade to *Symphony*."
>
> **BEN ROSEN**
> **financier and former chairman, Lotus Development Corp.**

the Alt-function key combinations. Don't worry about memorizing all 20 functions; like *1-2-3*, *Symphony* comes with a plastic overlay that identifies the dual functions of each key.

Alt-F10 brings up a menu of environment choices:

```
Sheet DOC Graph For Comm
```

Like most commands in *Symphony* as well as those in *1-2-3*, these can be selected in one of two ways. You can highlight your selection with the cursor and then press the Enter key, or simply type in the first letter of your choice. Choosing DOC (short for document) transforms *Symphony* into a word processor. Figure 1 shows the word processing environment. A window frame occupies most of the display, enveloping the text. The top of this window is a format line that determines tab settings and margins. You press the F10 key to bring the word processing menu to the screen above the format line. A menu pointer highlights the COPY command in the figure, indicating that you can choose that option by pressing the Enter key. The top line of the display describes the highlighted option.

Figure 1: *Symphony's word processing environment.*

You only make use of the command menu when you want to manipulate the text. Otherwise, you simply type. As you type past the right margin, *Symphony* wraps your text around to the next line. You need only to press Return after paragraphs. The Ins key toggles to control whether what you type is inserted into the text or whether it overwrites existing characters.

A menu-oriented word processor is far more pleasant to use than one that requires learning special command codes. Commands are in English, and if you don't recognize the function of a command by its name, just place the menu pointer over the command and read the descriptive line that appears on top of the display.

Symphony also includes a Help disk with over 100 on-line help screens. The Help key (F1) replaces the DOC window with a page of explanation. *Symphony*'s Help key is "context sensitive": If you press Help after invoking the word processing menu, you get an explanation and description of that menu. Pointing a cursor to one of the commands listed on this Help screen elicits a more detailed explanation of the command. You might be able to learn *Symphony* by experimenting and invoking Help, although this would not be the most efficient technique.

The Word Processor

The word processor handles most if not all of the operations you would expect to find in a dedicated word processing package. You can copy, move, and erase blocks of text; search and replace all or some occurrences of text; left or right justify or center text; create multiple format lines that assign unique tab, margin, and justification settings to different sections of text; print the text single, double, or triple spaced; and underline or boldface text. The menu does not contain an option to print the document. Because printing is a procedure that you would perform in any of the five environments, it is an option on the Services menu.

If you select COPY, MOVE, or ERASE, *Symphony* asks you to indicate what text you want to affect with the command by expanding a reverse-video cursor over the text. *Symphony* highlights the text so that you know exactly what you are copying, moving, or erasing. Actually, these three commands appear in the spreadsheet command menu as well, to let you copy, move, or erase cells. The commands perform the same functions in the spreadsheet context—another example of uniform command structure.

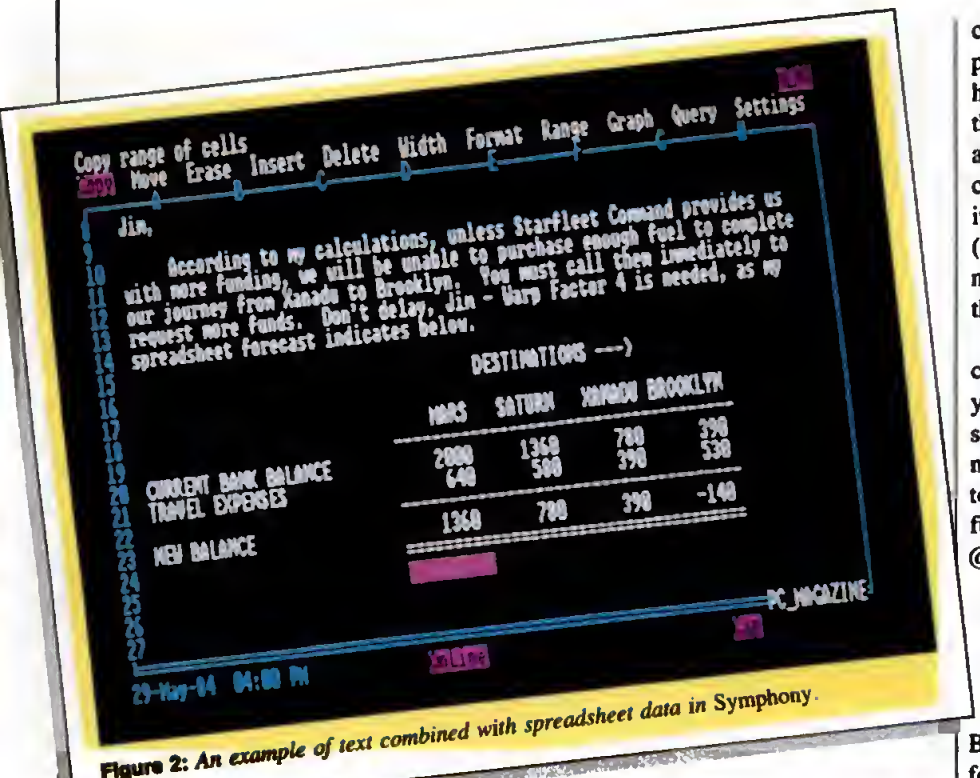


Figure 2: *An example of text combined with spreadsheet data in* Symphony.

Data Is Data

The relationship between the document in Figure 1 and the worksheet that stores the data for all *Symphony* environments is portrayed in Figure 2. While in the word processor, you press the TYPE key sequence (Alt-F10) and select SHEET to convert the document window into a spreadsheet. Note the change in the window frame. The top border of the window, which is a format line in the DOC environment, indicates the columns of a spreadsheet, and the left border indicates the spreadsheet's rows. The indicator at the top right of the screen has changed from DOC to SHEET.

The text looks essentially the same in a SHEET window. In the spreadsheet context, though, each line of text occupies a row of the spreadsheet. Because this is a SHEET window, you can put numbers and formulas into the cells of the spreadsheet to develop a revenue forecast.

You'll feel right at home in the SHEET environment if you are familiar with *1-2-3*. The commands are generally the same, and *Symphony* retrieves *1-2-3* worksheets directly. Only the macro language is different. The spreadsheet command line includes, for the most part, commands that are available in *1-2-3*.

Symphony contains *1-2-3* features such as sorting the spreadsheet, "what-if" tables for sensitivity analysis, database querying, variable column widths, distribution tables, and multiple iterations, and it has some new features as well. *Symphony* includes 70 formula functions—financial, statistical, logical, mathematical, string, calendar, and special purpose—that perform automatic computations.

Among the most important additions to *1-2-3*'s repertoire are character string functions. If you have a string of characters, you can use these functions to dissect it into substrings. One application for this capability is in coded numbers. For example, in an invoicing system you might have a six-character alphanumeric code that uniquely identifies each invoice (such as NY256A). The first two letters of the code (NY) indicate the state in which the item was sold. The next three numbers (256) constitute the invoice sequence number. The last letter (A) is the initial of the person being invoiced.

If you wanted to determine whether to charge sales tax on a particular invoice, you would need to look at the state code separately. For similar reasons, you might need to break up the invoice code in order to identify the other two subcodes. String functions like @LEFT, @RIGHT, and @MID allow you to extract the left-most, middle, or right-most characters of a given character string.

You can concatenate strings in the spreadsheet as you would formulas. If cell A1 contained the word *far* and B1 contained *fetched*, then storing the formula +A1&"-"&B1 yields the

> "*Symphony* is very powerful—and cluttered. *1-2-3* is a gem; it's clean—the best designed integrated package ever. It's a work of art, a classic. *Symphony* stacks features on top of *1-2-3*; it is confusing. Although *Framework* is complex, the package fits together."
>
> **ADAM GREEN**
> **noted *dRASE II* teacher**

string "far-fetched." If you had a string, such as Widget Corporation, in cell J10 and used it in a report title in one area of the spreadsheet, you could use this same string as the title of another report (in cell F1498, for instance) by storing the formula +J10 in cell F1498.

A Form Orientation

Symphony's database management program is a vast improvement over *1-2-3's*, although it's not quite as simple to use as the other modules in the package. The database manager is forms oriented; you create a database by designing an electronic form on the screen containing the items that make up a record. After creating this electronic form, you can enter records into the database by filling out forms.

A database is a collection of these completed forms. To review the forms, you need only give *Symphony* the name of the database you want to peruse. You can then browse through the set of forms by pressing the PgDn key to move to the next form and PgUp to backtrack to the previous form or by using commands to pinpoint particular records. *Symphony* handles computed fields, default fields, and edit checks, too.

You can sort the forms on three sort keys and perform database queries to locate a particular form or to select a subset of forms based on criteria that you define. *Symphony* has a particularly easy way of doing this; you call up a special blank form to the screen and enter selection criteria into the appropriate fields. To locate Shakespeare's *The Tempest* in a library catalog database, you would simply enter SHAKESPEARE, W. in the Name field and *The Tempest* in the Title field. You can also use logical comparisons and formulas to create much more complex criteria.

The forms-oriented approach disguises the fact that the database is actually stored in the worksheet as a set of rows, one row per record. If you want to view or manipulate the database as a spreadsheet, you can do so by switching from the database environment to the spreadsheet.

Coordinating a Symphony

Symphony's spreadsheet is perhaps the most powerful one on the market today; the other environments, while not as remarkable, have enough depth to fulfill most software needs. But the magic of *Symphony* lies in using the various environments in unison.

The most important tool for implementing an integrated application is windowing. It is possible to ignore *Symphony's* windowing capability entirely, which is helpful for novices who want to start learning *Symphony* without complications like this one. However, when you begin to combine different functions, windowing allows you to display them on the screen simultaneously. You create a window by selecting CREATE from the Windows menu (which you access through the Services menu), naming the window, and assigning it to one of the five work environments. The window may be any size you like; you use the arrow keys to control the length and width. You can place the window wherever you like on the screen. Windows can exist on top of one another or side by side.

You can have as many windows as you like, but if you put more than a couple of windows on the screen at once, your perspective in any given window will be rather limited. For example, if one of the windows is a document, you might want it displayed with other windows, but you might also wish to use the word processor exclusively with its window expanded to the size of the entire screen.

The Zoom key (Alt-F6) takes care of this problem. Point a cursor at any partic-

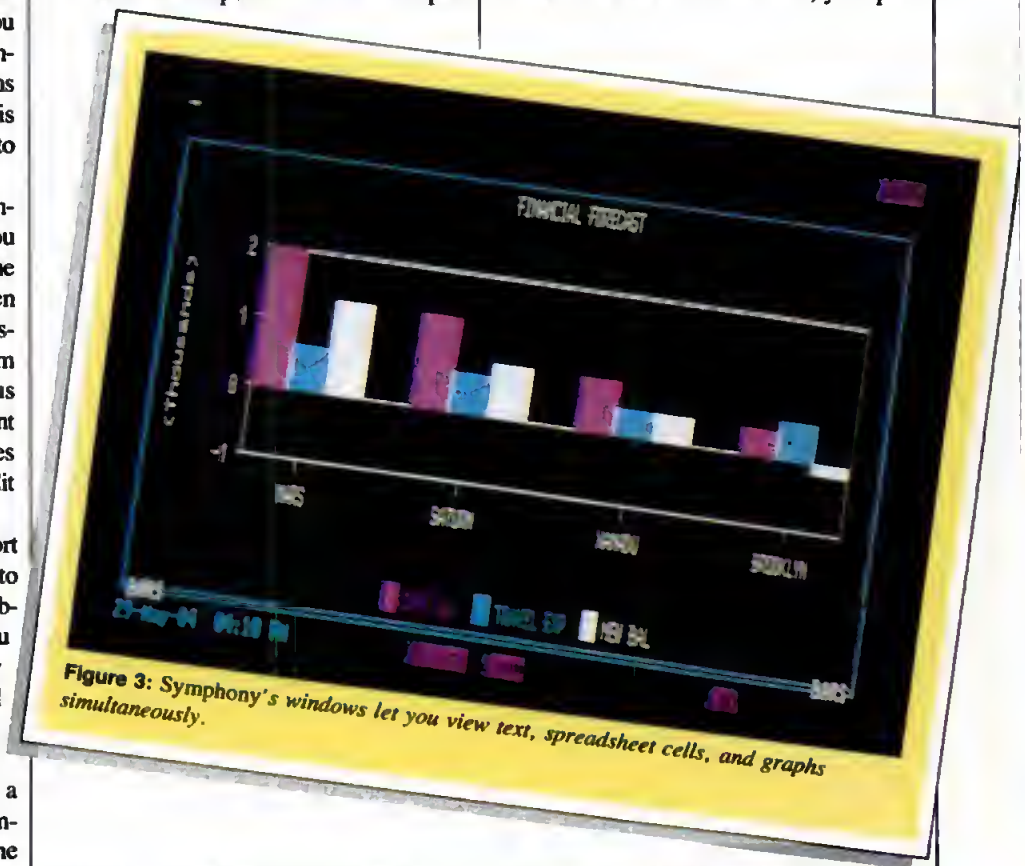


Figure 3: *Symphony's windows let you view text, spreadsheet cells, and graphs simultaneously.*

ular window, press the Zoom key, and that window will blow up temporarily to occupy the entire screen (see Figure 3). You may then work with that window as if the other windows did not exist. Press the Zoom key again and the window returns to its original state.

Windows are useful for integrated projects, but they also benefit single-function applications. If you use the word processor to develop a long document, you might use two windows to view two remote sections of the text that would not otherwise appear together on one screen.

Using windows, you could display a section of a database in one corner of the screen; reserve another corner for a spreadsheet window showing summary statistics derived from the database; use a word processing window that contains a table based on results of the spreadsheet; and display bar, line, or pie charts in other windows on the same screen. If you change an entry in the database window, the other windows are automatically updated. That's what integration is.

> "Ashton-Tate is aggressively marketing *Framework*, but this company is less well-known than Lotus, and many people aren't aware of it. *Symphony* is an extremely good product; it's what *1-2-3* should have been. *Symphony*'s design will make it a leader. It's a strong product, and it's from Lotus, a company strong enough to act as a leader. It should do well because it has addressed criticisms against *1-2-3*. It goes beyond and will overshadow other products like *Context MBA*."
>
> **ROBIN WEBSTER**
> **West Coast bureau chief,**
> ***PC Magazine***

> "*Symphony* is more than a logical extension of *1-2-3*. The integration is more complete, closer to seamless. Its emphasis on document preparation makes it a worthy competitor to *Jack2*, the reigning champion of seamless integration."
>
> **BILL MACHRONE**
> **editor, *PC Magazine***

Unlike window management programs such as *Desq* and *Windows*, *Symphony* is designed as a closed system. Its windows permit you to share information between environments, but you cannot directly use a *Symphony* window to run another software package.

The purpose of window systems is to facilitate the sharing and transfer of data between programs. They let you use your dedicated word processor with your dedicated spreadsheet in one integrated environment, but you must be familiar with the commands of both packages in addition to the window manager's own commands.

On the other hand, if you have an integrated package that already includes all the functions you require, you don't need to window your way through packages with totally different command structures. *Symphony* combines the data-sharing attributes of windowing with the economy of a uniform command structure.

Symphony Communicates

Symphony doesn't ignore the outside world completely, though. You can import ASCII files produced by other programs, such as word processors, into the worksheet. A TRANSLATE command converts *dBASE II*, *VisiCalc*, and DIF files into *Symphony* worksheets.

In the communications environment, you can use *Symphony* to exchange worksheets with another *Symphony* user over the phone line if you have a modem and an asynchronous adapter. You can also transmit or receive files from a mainframe computer or hook up to database services or electronic mail networks, and you can feed the incoming data into a range of the spreadsheet or get a hard copy on your printer. You can also teach *Symphony* how to automatically log on to an information service. It can dial an access number and transmit a password.

All of these bells and whistles are certainly nice, but *Symphony's* most exciting feature is the *Symphony* Command Language, which lets you tailor *Symphony* to particular tasks. Users of *1-2-3* will recognize this feature as the macro capability, but they will be delighted by the extent to which *Symphony's* macro powers surpass those of *1-2-3*.

A macro is a group of *Symphony* com-

mands that are executed in a batch. The *Symphony* Command Language allows you to mimic any series of keystrokes you might press in a normal sequence of commands and entries. For example, if you issue a monthly consolidated sales report that involves combining ten sales spreadsheets into a summary table, you could store the appropriate keystrokes in a macro. Each month, *Symphony* would combine the files and print the report automatically.

The Command Language can do more than merely store keystrokes, though; it can be used as a complete procedural language. For the aficionado, it includes commands to loop within procedures, branch to subroutine procedures, beep the computer's bell, prompt the user for entries, perform conditional logic, control error processing, or place a phone call. You can even program *Symphony* to wait until a particular time of day before executing a procedure.

You can develop your own menus that function just like *Symphony* menus. When the user chooses an option from a menu you created, *Symphony* executes a procedure based on the option selected. You can create completely automated, menu-oriented templates for people who don't know how to use *Symphony*. With *Symphony*, Lotus has made it possible for anyone to be an applications developer.

Not as Easy as 1-2-3

Given this myriad of features, *Symphony* is not "as easy as 1-2-3" to learn. While each individual environment is easy enough to pick up (the database is a bit more cumbersome to learn and use than the other environments), many users will suffer from feature shock. Beginners will have to take things slowly, starting with a single environment and easing their way into others. Learning *Symphony* is like learning to cook. It's easy to learn how to prepare a single dish. But becoming a master chef requires time, experience, and artistry.

To help you get started, Lotus has packaged a disk tutorial with *Symphony* as it did with *1-2-3*. The *Symphony* tutorial consists of 16 lessons that run about 15 minutes each. The lessons are on an introductory level; though many users will appreciate this, most will look to manuals and third-party learning materials to make full use of the program.

Symphony is a memory-intensive program—the entire worksheet is processed in memory. On a Compaq equipped with 544K RAM, *Symphony* ate up 293K and left me 251K. If you have a 320K system, you may well bump against the memory limits of the system.

> "*Symphony* has a slight advantage in that it is competing on Lotus' home turf; integrated software began with spreadsheets in mind. *Framework* isn't as focused on the spreadsheet, so it may not be as natural a progression for dedicated *1-2-3* users."
>
> **MIKE EDELHART**
> **executive editor,**
> ***PC Magazine***

Since there is only so much RAM that you can pack into a PC, memory is the chief constraint of the software. The worksheet theoretically handles 256 columns and 8,192 rows, but in reality you can only use part of this grid because of the memory constraint. Symphony is therefore inappropriate for large production databases. On the other hand, the large memory requirement means that *Symphony* operates very quickly. Calculation speed, screen paging, and tabbing are about as fast as *1-2-3*. Pointer movement is slightly slower than *1-2-3* but not significantly.

If you have a monochrome display adapter, you cannot display graphics on the screen, although you can obtain hard copy graphs. An IBM color adapter, Hercules board, or Compaq will permit you to display text and graphs simultaneously, but the color adapter will not display color graphs if it must share the screen with text. If you want color graphs and text simultaneously, you must have a special supported graphics board such as the Plantronics ColorPlus.

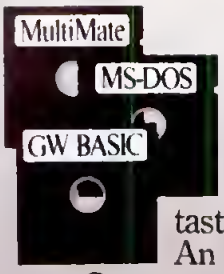
While your monitor may be able to display *Symphony* text and graphs together, your printer cannot. At present, *Symphony* cannot produce a hard copy of text intermingled with graphs. Other packages have this capability, but they sacrifice resolution and output quality by using block graphics characters to produce graphs. Lotus opted for the higher quality of bit-mapped graphics. I would be surprised, though, if Lotus or another party did not probably develop an add-in program that resolved this limitation by permitting the entire bit-mapped display to be duplicated on a graphics printer.

At a list price of $695, *Symphony* is at the high end of the integrated software market. With a $200 exchange option, many registered *1-2-3* owners are likely to convert to *Symphony*.

Symphony is likely to have a powerful effect on the integrated software marketplace. I predict that manufacturers of rival products will have to lower their prices in order to compete. This is good news for the user community: We will be able to buy more power for less money than ever, and the standards of integrated software will be raised on all levels.

Best of all, *Symphony* and programs like it give the common user the power to perform miracles. Software will never be the same. ■

HOW TO RUN THE WORLD.



Without software you're nowhere.

That's why the Corona PC runs virtually everything. Word Star.[1] dBASE II.[2] Lotus 1-2-3.[3]* Thousands of packages in all. But we didn't stop there.

We give you 60% better graphics than IBM.® So your pie charts look tastier. Double the memory. So you can run bigger programs right out of the box. An improved keyboard. For easier typing. We even lowered the price. That puts Corona at the head of the IBM class.

The Corona PC. Once you can run the world, running the office looks easy. In North America, call 1-800-621-6746 for the Authorized Corona Dealer near you. In Holland, call 020-03240-18111. There are over 1600 dealers worldwide. And their job is to help. Service by Xerox.

corona data systems, inc.

THE CORONA PC

© Corona Data Systems 1984 1 TM Micropro Corp. 2 TM Ashton Tate 3 TM Lotus Development Corp *HTS driver needed for graphics only

CIRCLE 215 ON READER SERVICE CARD

YOU DON'T HAVE TO REMODEL TO ADD ON.

With some computers, the more you do, the more you have to add on.

A little memory expansion here. A graphics adapter there. Next thing you know, you need an expansion chassis. And a loan from the bank.

Corona builds memory expansion (up to 512K) and high-resolution graphics right into the main board. That saves you money. And expansion slots. Plus, our 128K standard memory and IBM® compatibility let you run thousands of software packages right out of the box. The net result is a PC that grows on you. Painlessly.

The Corona PCs.

It's a matter of simple addition.

In North America, call 1-800-621-6746 for the Authorized Corona Dealer near you. In Holland, call 020-03240-18111. There are over 1,600 dealers worldwide. And their job is to help. Service by Xerox.

corona data systems, inc.

THE CORONA PC

©Corona Data Systems 1984

CIRCLE 216 ON READER SERVICE CARD

HARDWARE • ROLAND RACKO

The Sharp PC-5000: A First-Class Traveling Companion

Sharp Electronics' feature-laden lap-size portable computer is one of the first of its kind to offer desktop power and flexibility at a competitive price.

Photograph: Dennis Kitchen

SHARP PC-5000

The real treasures of computer lapland have always been out of reach. Most entries into the laptop market have either had toylike capacity or else have been extravagantly priced compared to desktop units of similar power. But Sharp Electronics Corporation has been quietly and effectively building its expertise in lap-sized computer technology. The result is the Sharp PC-5000, a laptop unit that not only rivals current desktop offerings in power and range, but also is priced competitively.

Weighing 13 pounds with optional built-in printer, this diminutive but stylish battery-operated unit contains enough internal memory to perform serious spreadsheet analysis, text processing, or code development. Its built-in bubble memory provides easy access to external data in the quantities that grown-up data appetites demand. Its fold-up LCD screen means that the convenience of visual interaction can follow you wherever you go. Devices such as disk drives, modems, and external printers can be easily attached when you settle down somewhere. Initial software released by Sharp includes a time scheduler, a versatile spreadsheet package, a text processing package, and a modem communications support program. In addition, many of the programs made for generic MS-DOS machines will run quite comfortably on this machine.

The built-in printer on the PC-5000 takes thermal and plain paper.

FACT FILE

PC-5000
Sharp Electronics
10 Sharp Plaza
Paramus, NJ 07652
(201) 265-5600
List Price: $1,995 (includes 128K RAM, monitor, BASIC ROM cartridge, 128K bubble memory cartridge and bundled software including *SuperTools* master menu, *SuperWriter*, and *SuperComm*). Dual 5¼-inch floppy drives are $995, 360K battery-operated 3½-inch minidisk drive, $695; 128K bubble memory cartridges, $269; 64K RAM cartridges $169; 128K RAM cartridges are also available. Printer optional, $399.

CIRCLE 737 ON READER SERVICE CARD

Analyzing even a small machine is a big project. A look at the Sharp's innovative hardware, beginning with the video display, is as good a place as any to start. The video display is a heavily used unit on any computer system. Through it you get the straight scoop to and from your machine. The PC-5000's nontraditional, liquid-crystal display elicits strong reactions, both positive and negative. Of course, the beauty of any display screen is in the eye of the beholder—human preferences in this area are so varied that no single screen can satisfy everyone, and no real agreement on what to look for exists. For me, the three crucial elements are information bandwidth, legibility, and special effects.

The Sharp PC-5000's information bandwidth on a line basis is considerably less than on the typical desktop screen, measuring 8 lines by 80 characters in the normal mode. For many uses, these eight lines are plenty. Text entering, code construction, spreadsheet creation, and command entering all proceed easily, largely because the human mind doesn't often think in terms larger than individual lines when working in this way. Additionally, Sharp's release of Sorcim's *SuperTools*, which provide the basis for some of these activities, have been well adapted for the smaller screen size. Displaying intermediate clumps of creative work is a bit more of a chore, often requiring paging back and forth, which would usually be unnecessary on a larger display. This chore is aggravated by a relatively slow screen update. However, even large displays are not immune from these sorts of problems.

And since the Sharp has a built-in printer, you can dump intermediate clumps of data to paper for inspection in a bigger frame. You soon develop a synergistic way of using the printer and LCD screen together to overcome the screen's bandwidth limitations.

On a dot basis, the LCD screen's bandwidth is easily as good as that of a typical desktop computer screen. For comparison purposes, if the LCD were expanded into a 25-by-80-line screen with the same dot density, it effectively would have 250 640 pixel characteristics. At its present size of 80 640 pixels, the Sharp PC-5000 can present graphs with excellent resolution (although the graphs are shortened in the vertical dimension when compared with conventional CRT displays).

The Sharp PC-5000's capability to tilt the display at various viewing angles is another plus. However, in order to obtain maximum legibility, the LCD must be carefully lighted. The contrast control helps compensate for varied lighting conditions, but the characters tend to lack punch even in the best of circumstances. Even in poor light, however, the characters are absolutely razor sharp and rock stable. There is no sign of the fringing, screen edge distortion, dot wander, herringbones, waviness, strobing, smear, or flicker that so often plague CRT displays. The characters are well formed and have a consistent visual density. Nonetheless, don't peer at the display for long stretches—get a good light instead.

The screen's special effects include light- and boldface characters in several different widths. I found that the boldface was the most readable. The reverse video and underlining features were completely effective. Cursor-driven programs presented a secure and convenient interface, and the menu effects provided by Sorcim's software made intelligent use of the screen options. The underlying screen manipulation commands allow rapid dot addressing, making animated screens practical. Obviously, the display's lack of a gray scale or color capability makes the many applications requiring such facilities impractical.

Bubbles

A few years ago, it appeared that bubble technology had burst. For a variety of reasons, several manufacturers had ceased supporting it. But this technology, which stores data by shifting patterns of magnetic regions (called bubbles) in special materials, has been successfully used by Sharp to give the PC-5000 a unique and effective approach to portability of large data files. The PC-5000's main unit contains a slot that lets a bubble cartridge function as a pseudo disk drive. Using MS-DOS' virtual drive capability, that slot may serve as either the A: drive or the B: drive, with MS-DOS prompting for the appropriate bubble cartridge as needed. The bubble cartridges themselves are cute, neat, robust little blue packages, which you may treat entirely like minidiskettes. It is a good idea to load up the bubbles before a trip to give yourself the flexibility of extra data memory or convenient storage for application programs.

The bubble cartridges are cute, neat, robust little blue packages, which you may treat entirely like minidiskettes.

The bubble cartridges are absolutely silent in operation; a small light lets you know when one is accessed. The system places the names of the MS-DOS programs contained in the main unit's ROM into the directory of the bubble. That way, any bubble inserted in the slot always has in its directory an extra set of items that represent whatever ROMs are currently in the unit. (Sharp has indicated that additional ROMs may be made available from independent vendors.) The bubble-storage space available to users is then tacked onto the end of those ROM items. It is not quite the 128K advertised, as some hidden MS-DOS system files, placed on the bubbles by factory preformatting, use up about 7K. The preformatting also buries a CONFIG.SYS file in the bubble. This burial makes CONFIG.SYS unchangeable except by sophisticated users who are familiar with MS-DOS system calls. This will probably not inconvenience typical businesspeople using the Sorcim *SuperTools*. My experience with the bubbles was positive; they are clearly the way to go for fully portable operation. I only wish they were cheaper.

The Printer

In the bad old days of the IBM 1403 chain printer, the way you dealt with the printer noise was to make it cute. For example, you could make it print sequences that made tunes out of the print-hammer tapping. Printers have evolved considerably since then, and the Sharp PC-5000 printer is as much of a mechanical and electrical marvel as the 1403 was in its day. But, like the 1403, its performance is also tantalizingly short of perfection. It still makes you want to do cute things with it rather than take it seriously. Print quality, not noise, is the primary issue here. The printer's output is fine for draft copies of text, compiler listings, directory listings, memos and other lightweight stuff, but it's not an ideal choice for formal business letters.

The printer can use plain or thermal paper. In the plain paper mode, the heat of the thermal printhead causes carbon from a ribbon cartridge to be deposited on the paper. Sharp makes the perfect plain paper for its printer, but it is quite pricey. Paper designed to work with Brother thermal typewriters works tolerably well and costs much less.

Sheets of paper are fed one at a time, an operation complicated by the LCD unit,

which first has to be moved out of the way. In addition, the paper frequently catches on the ribbon cartridge as it comes around under the platen. Luckily, the paper advance itself works well, with complete freedom from skewing. For extended work sessions, though, it's probably best to use roll-fed paper.

The printer has such a high-resolution dot matrix for character formation that it is capable of producing extremely detailed and sharp characters, although individual letters are occasionally muddy or ill-formed. Printing on plain paper with the carbon ribbon produced the darkest characters, but thermal paper had the best character-to-character consistency, and I felt it was superior overall. The print fonts could use some redesign; for example the verticals on the *m* and *w* appeared too narrow in lightface caps and too heavy in lowercase bold.

Programmable options for two separate fonts in both boldface or lightface, along with three different page widths, are packed into the printer controller. A 149-column width allows printing remarkably readable (although necessarily tiny) characters on wide pages. Simple commands also allow the printer to duplicate information from the LCD as it comes up on the screen. The undocumented BASIC commands LCOPY 0, LCOPY 1, and LCOPY 2 allow you to dump the screen to the printer in three different formats. The printer uses a light-sensing mechanism to determine the end of the ribbon. Unfortunately, this mechanism is occasionally fooled into giving a false indication by the careful lighting required by the LCD. This problem, like the paper-catching glitch, can be solved with judicious applications of masking tape in the right locations, but it should never have existed in the first place.

Digit Soup

Communications are critical to the usefulness of a portable computer. As part of its bundle of *SuperTools* software, Sharp provides Sorcim's *SuperComm*. This package is integrated to work with Sharp's Direct Connect Modem as well as external modems. The Direct Connect Modem is a small, attractive unit that fits neatly into a recessed compartment in the LCD when not in use. The *SuperComm* menus and help screens are well implemented and a beginner doing routine communication with a remote computer should have no unusual troubles. Experienced people who must talk to a large number of computers each using unpredictably different communication protocols, or who have a large amount of data to move around, may feel frustrated by the program.

The Direct Connect Modem cannot auto-dial numbers of greater than 16 digits. If a person is calling computers via a non-AT&T long-distance service, the digit soup required may exceed the capacity of the dialer, making a large part of the automation provided by *SuperComm* and the Direct Connect Modem unavailable. The Direct Connect Modem does not support 1200-baud communication. Users with large volumes of work to do away from home base might want an external modem capable of that speed. Unfortunately, using an external 1200-baud modem presents its own problems. The update speed of the LCD screen is quite slow, requiring the Sharp's CPU to do considerable buffering of received characters. If the host is sending characters at a good clip and you want to stop the characters with a termination sequence, the Sharp has to empty its buffers to the screen before it can send your sequence. So, despite the speed advantage offered by 1200-baud communication, you still wind up being trained in patience.

Although the *SuperComm* manual does warn you, there is no excuse for the printer dropping characters at 1200 baud when you tell *SuperComm* to duplicate screen contents to the printer as they are displayed on the LCD. Also, *SuperComm*'s failure to keep the screen tidy when performing this duplication is inexcusable. The options menu for setting up the communication protocol has the nice feature of remembering the last setting you used. But the options menu is not organized for frequently changing protocols. It does not remember the position in the list of the last option you changed. It is annoying to be forced to go through a seven-key sequence for every parity combination you try as you experiment to see which one works on the number you just dialed. Finally, while *SuperComm*'s menus provide hand-holding access to many MS-DOS facilities, at times some facilities lie outside the bounds of these menus. Changing contexts to get at such a facility without losing the remote computer is a 40-second exercise, with copyright banners, function key depressions, and requests for confirmation along the way. This same phenomenon occurs even within *SuperTools*, if, for example, you want to suspend *SuperComm* and go to *SuperCalc*^{2} to prepare a spreadsheet for modem transmission. This design wastes too much precious time.

There is no excuse for the printer dropping characters at 1200 baud when you tell SuperComm to duplicate screen contents to the printer.

Receiving data from the remote computer is blessedly transparent; I didn't find any sequences that made the Sharp burp—that's a plus. But there was also no way to turn the transparency off so that the remote computer could send cursor control sequences that would affect the LCD screen. Under *SuperComm*, the Sharp PC-5000 can emulate only a dumb terminal. *SuperComm*'s send/receive protocol for files is primarily a Christensen protocol (known also as XMODEM) that is popular

but not universal. A prospective user of *SuperComm* should verify that the remote computer in question supports this particular protocol.

The Direct Connect Modem can also be used as a numeric keypad for data entry. Because of its built-in microphone and speaker, it also functions as a hands-free telephone. Voice quality in the hands-free mode was exceptionally good in both directions, but a slight background whine emanated from the speaker and also from the phone line.

Under the Hood

A stripdown of the main unit revealed a surprisingly spacious construction; nothing looked cramped or crowded. There were plenty of precision-stamped bracing members and the mating of bracing members was excellent, with accurate tolerances evident on all interconnecting members. For those of you who don't look under the hood, this bracing ensures that your Sharp will get where it's going in one piece. All construction was modular with easily separable subsystems. While *PC Magazine* has no standard drop test, I accidentally had the opportunity to test the robustness of construction. In my case, it occurred at an airport, when the shoulder strap of the carrying bag containing the Sharp main unit and disk drive suddenly broke, causing both units to drop about 2 feet onto concrete. The units suffered no damage.

Inside, four boards were visible: bubble driver, ROM, RAM, and CPU. The boards were of high-quality construction and no engineering patches were apparent. The boards were all well braced at multiple points. Electrical connections between them were made with sockets and ribbon cables. A NEC 8088 was used on the CPU board and NEC 4164 RAM chips were used on the RAM board. Two spare mounting pads were visible on the ROM board, so you might expect that future enhancements to internal ROM software are a possibility. The unit's size reduction was accomplished by avoiding the stan-

PERFORMANCE CHART

	Excellent Points	Good Points	Annoyances	Needs Work
HARDWARE				
Main Unit:	• Keyboard touch • Compactness • Colors & visual appearance	• Weight • Operating time on battery • Price • Construction • Expandability	• Slow speed • No 8087 processor	
Printer:	• Dot detail • Size of unit	• Flexibility of fonts and widths • No skewing	• Paper loading • Speed • Special paper needed	• Consistency of character quality
LCD:	• Solidity and sharpness of image • Tilt feature	• Character shape • Resolution • Flexibility of fonts & widths	• Contrast • Size of display	
Bubble Memory:	• Convenience	• Physical size of cartridge • Robustness	• Can't adjust CONFIG.SYS file • Space taken by system files • Limited storage capacity	• Price
Mini-Floppy:	• Reliability	• IBM format compatibility	• Noise	• Hard disk add-on capability
Modem:	• Size of unit • Voice quality	• Appearance • Numeric keypad	• Whine • No built-in 1200 Baud	• No more than 16-digit • Auto-dial capability
SOFTWARE				
Documentation:	• Sorcim *SuperTools*			• MS-DOS manuals
Communications:	• Easy for novice		• Tortuous context shift to MS-DOS or other tools	• Drops characters on printer at 1200 baud
Spreadsheet:	• Tutorial	• Versatile	• No macros	
Text Processing:			• Tortuous context shift	
Other:		• Alarm system • Menu layout & function key consistency	• Not entirely PC-compatible	

This table summarizes the various features and flaws of the Sharp PC-5000. "Excellent Points" are astounding, mind-boggling qualities that you should drop everything and write your mom about. A favorable mention of the machine's "Good Points" the next time you are at a cocktail party will indicate that you are a member of the inner circle. Items in the "Annoyances" category are the ones that you wish would really just quietly go away because they form an unsightly blot on an otherwise well-crafted instrument. Finally, whoever was responsible for approving an omission, bug, or nonfeature labeled "Needs Work" lacks discriminating taste, common sense, and foresight, and all manner and number of the King's men should be assembled to fix this up as soon as possible—or earlier.

dard DIP ICs in favor of flat-pack and leadless carrier versions. Several custom components and hybrids were also visible. Shielding plates to prevent RF interference were everywhere, and some areas were double shielded. The power supply was in its own separate cage.

The keyboard was solidly constructed and well braced. A dust membrane under the keys keeps flying bits out of the innards. Like the other subassemblies, the LCD screen unit is completely modular. It is packaged internally with rubber damping to absorb shock. Several electrical components housed in the subassembly help drive the LCD display. Shielding plates were also visible in this unit.

The line printer, shock mounted in its own metal basket, contains three motors for control of paper advance and printhead motion. It has its own controller board that attaches to the main CPU board via a ribbon cable and, as a nice touch, a zero-insertion-force connector. Since the printer is a user-installable option, such a connector helps ensure that fumble-fingered users don't put stress on the ribbon cable.

More Gas

Perhaps as a move to conserve power during battery operation, Sharp runs its 8088 processor at a speed below that of typical desktops. The prime number test used in *PC Magazine*'s evaluation of other IBM compatibles (see the cover stories in *PC*, Volume 3 Number 6) took the Sharp about 2 minutes and 53 seconds compared to an IBM PC's 1 minute. A compiled C program that wrote a file of 20 records of 1,024 bytes each to disk 10 times took 61 seconds, compared to a PC's 55 seconds. Bubble-write time was about the same as the Sharp disk. The same number of read operations took 1 minute, 43 seconds on the Sharp floppy as compared to 58 seconds for an IBM PC. Bubble-read time was 1 minute and 38 seconds.

The machine is a bit slower than the IBM PC all around. Normally, this wouldn't bother me in lap-sized device; I'd be grateful to have anything at all. But since the Sharp is such a generally strong performer, I'm tempted to use it as a desktop workhorse. It sets such standards for itself in other areas that the impatient finger twiddling becomes annoying.

Average speed for the printer was about 14 characters per second in the 80-column mode. This is far less than the advertised 37 characters per second. While the printhead appears to move at the advertised speed as it forms characters, the carriage-return cycle drops the effective speed. Nevertheless, 14 cps is tolerable considering the printer's portability and flexibility.

Battery power provided about 6 hours of idle power-on time but only about half an hour of operation under a heavy combined load of the printer, bubble, and modem. The Sharp's main unit was impervious to pulling the plug while being powered from the AC pack—indicating a well controlled switchover from AC to battery operation. Floppy drives performed flawlessly, and somewhat quieter than the PC's drives. Extra RAM and ROM cartridges slip easily in and out of slots in the bottom of the main unit. These provide a nifty way to keep the software capacity from topping out early.

The PC-5000 has no provision for 8087 support, and a Sharp spokesman indicated that such support is not planned at this time. Regrettably, neither is hard disk support in the works. Soon to be delivered, though, is a battery-powered 3½-inch disk drive and a direct video interface for a full-size external monitor.

PC-Compatible?

In a phrase, the Sharp PC-5000's PC-compatibility could be described as, "close, but no cigar." My tests revealed that the Sharp would generally run any PC-compatible commercial software that did not think an IBM screen was around. So, for example, the Whitesmiths and Lattice C compilers ran perfectly. On the other hand, programs such as *1-2-3*, *WordStar*, and *Flight Simulator*, which depend on the IBM screen characteristics, the IBM diagnostic programs, or PC-DOS, would either give an error message on the LCD screen or send the machine off into hyperspace—from which recovery was possible only by powering down and up. IBM utilities such as DISKCOPY also caused hyperspace runs or failed to load at all. (The Sharp-supplied version of DISKCOPY, of course, performed satisfactorily.) *dBASE II* was somewhere in between. Most features worked, but browsing was problematic.

Reading and writing IBM-format disk-

The keyboard layout is different from the PC's, which is either a plus or a minus depending on your personal preferences.

ettes was more satisfactory. The higher density nine-sector diskettes could be read or written without a hitch. IBM single-density diskettes could also be read or written, but only if the original start-up boot was from the Sharp MS-DOS resident on diskette. If booting was done from the bubble version of MS-DOS, not even the directory of a single-density diskette was readable. This difference between bubble and diskette boot-program capabilities could be confusing. Copying files from bubble to diskette works only with the COPY command. DISKCOPY complained when asked to try.

The keyboard layout is different from the PC's, which is either a plus or a minus depending on your personal preferences. Key placement is more conventional for standard letter and special character keys. Some of the keys are bigger and thus easier to use for hunt-and-peck typists. Some keys found on the PC's keyboard are not

present on the Sharp and the Sharp implements some special features that have no equivalent on the PC. Especially interesting are the On/Off keys. These keys can be used to put the Sharp to sleep—either for a pre-set interval or until the On key is pressed. Upon waking, the Sharp will then do various programmable things such as start up communications or play tunes at you in a three-octave scale. The Sorcim *SuperTools* also provide access to this feature for calendar reminders. The PC's PrtSc key is missing, although the Esc-7 key combination is an undocumented escape sequence that causes the printer to display a remarkably miniaturized version of the current screen contents.

UNIX Too

Encouraged by the Sharp's response to the standard tests, I devised an even more revealing compatibility test. Whitesmiths, Ltd., makes a multiprocessing multi-user UNIX lookalike called Idris. The IBM PC version of Idris runs as a "program" under MS-DOS, allowing concurrent access to both MS-DOS and the Idris multiprocessing facilities. Whitesmiths does not officially support a non-hard-disk version of Idris. The company's position is that a typical user will want to have on-line all 1.7 megabytes of utilities, compilers, text-processing stuff, and other wondrous goodies. It is a well-kept secret, however, that Idris will actually run on anything except a pop-up toaster.

How does Idris do on the Sharp? By diligently extracting salient intelligence from Whitesmiths' detailed installation guide for hard disk applications, I configured a creditable system running on the Sharp with only mini-floppy drives; there were, however, fewer goodies directly on-line. Even more interesting, after a little surgery on the bubble memories, I managed to further move Idris and a handful of utilities to the bubbles alone. Armed with a belt clip full of bubbles, the Sharp main unit, and an airline ticket, I took to the sky. I couldn't resist trying "cordless" Idris while on the plane. In went the MS-DOS bubble to boot MS-DOS; in went the Idris bubble to get up Idris and its word processing software. In went the commands to set up a RAMdisk simulated under Idris. And there I had it, UNIX-type facilities on batteries and bubbles 20,000 feet in the air. I had fulfilled Tom Plum's prophecy of lap-size wonders from the UNIX world ("A Classy Idris in the UNIX Neighborhood," *PC*, Volume 3 Number 10).

A Dying Boast

In Stanley Kubrick's classic movie *2001: A Space Odyssey*, there is a poignant scene where the last remaining human aboard the Jupiter probe vessel *Discovery* is forced to dismantle HAL, the great on-ship computer. Sneaking past HAL's safety circuits, the lone human slowly pulls out HAL's memory crystals one by one. As "his" mind is being removed piece by piece, HAL pleads for himself. As more and more crystals are removed, HAL's speech becomes less and less organized until, finally, the once-proud HAL is reduced to being capable only of singing a child's nursery rhyme.

The designers of the Sharp PC-5000 have included no such swan song. If you pull out all the bubbles, disconnect all the disks, remove all the RAM extensions, and defeat the ROM cartridge, somewhere deep in the heart of the Sharp PC-5000, a special circuit is activated. The Sharp goes into COMDEX mode. It begins to display a feature list replete with function-key-driven menus, graphic whizbangs, and sales-oriented narrative. HAL went down garbling a nursery rhyme. The Sharp PC-5000 goes down boasting, as well it should, for it is a nontrivial, feature-laden unit at a competitive price. ■

Roland Racko teaches UNIX and C language around the country. He also advises OEMs on systems analysis, hardware design, and software quality while still finding time to write code for Status Software. He first touched a computer console on an IBM 650 in 1960.

WAREHOUSE DATA PRODUCTS

CUSTOMER INFORMATION (602) 246-2222

Call for programs not listed. We will try to meet or beat any legitimate price for CP/M or IBM PC Software. Most disk formats available.

DATA BASE MANAGEMENT SYSTEMS
DBase II or DBase III Best Price ..... Call
Fox and Geller Quickcode $159
Condor III $330
NWA Statpack $350
TIM IV $249
Infostar $255
PFS File $95
RBASE 4000 ..... $285
Knowledgeman $275

WORD-PROCESSING
Wordstar, Mail Merge, Correctstar, Index $345
Wordstar $235
Mail Merge or Correct Star $130
Microsoft Word W/Mouse $287
Word Perfect $295
Volkswriter for IBM PC $110
Wang Spellchecker $36
Metasoft Benchmark $265
Multimate $275
Peachtext 5000 ..... $195

SPREADSHEETS
Calcstar $89
Supercalc II $159
Supercalc III $215
Microsoft Multiplan $159
Lotus 123 Upgrade ..... Call

ACCOUNTING
TCS. Equivalent of Peachtree - Specially Augmented By Warehouse Software Customized For Your IBM PC Terminal and Printer - GL, AR, PA, AP for PC XT, OOS 1.1, 2.0, CP/M-86, CPM-80
Each Module $75 For All Four $275
CYMA ..... Call
Dollars and Sense - Monogram $95
BPI GL, AR, AP, PA each $415
Real World, GL AR AP,PA .. each $350

TRANSFER PROGRAMS
Move-It $85
Microstuf Crosstalk $105

Best Price in U.S. for IBM PC or Clones
Multifunction Board—Includes Async Adapter, Parallel Adapter, Clock with battery back-up and Software, 64K Memory Expandable to 512K
1 year warranty $249

LANGUAGES
Lifeboat C Compiler $295
Microsoft C Compiler $315
Microsoft Pascal Compiler $215
Microsoft Basic Compiler $225
Microsoft Basic Language $235
CBASIC 86 for IBM PC $135
CBASIC CP/M-80 ..... $95

For the IBM PC - Winchester Drives
10 Megabyte Ext Drive $1095
30 Megabyte Ext Drive 1 Yr Warranty $2195

FOR PC DOS
Norton Utilities $55
Copy II PC $34
Prokey V3.0 ..... $66
Microsoft Flight Simulator $38

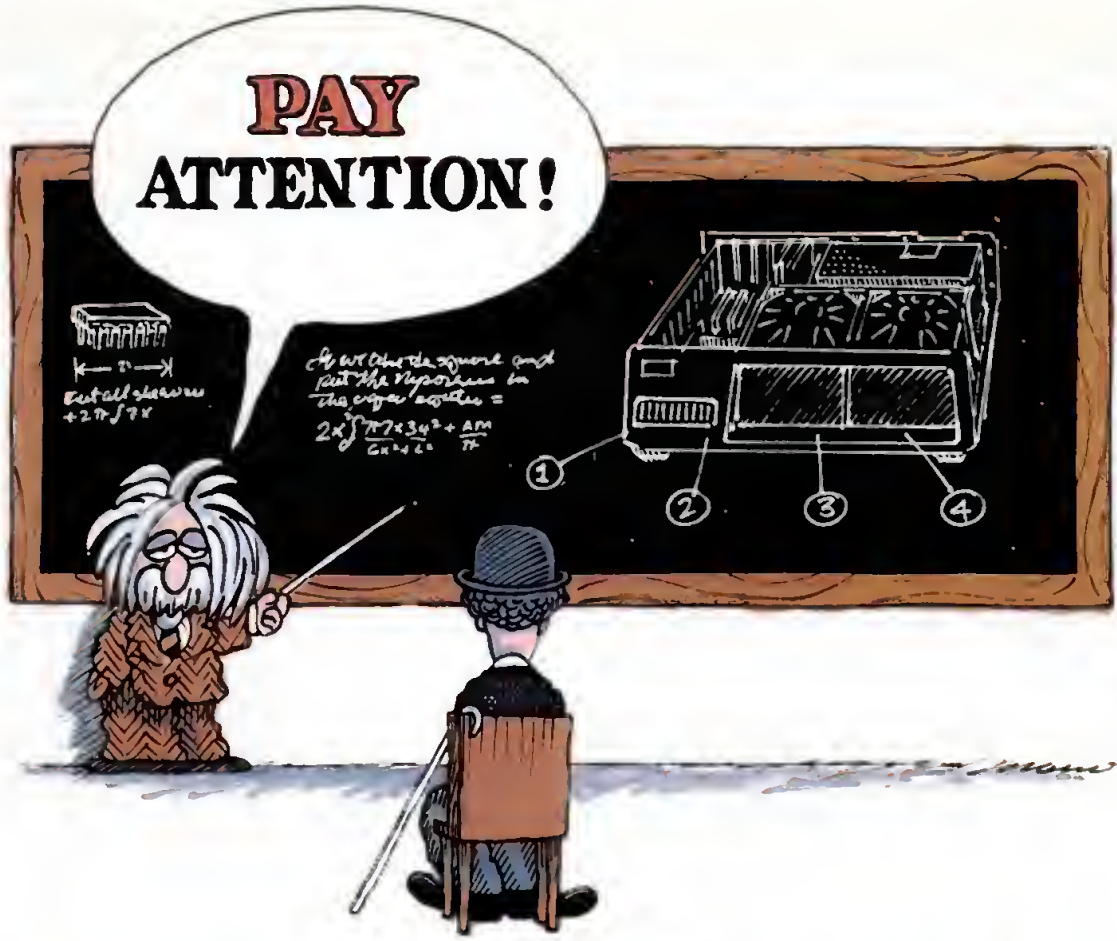
HARDWARE
Hayes 1200 Modem $495
Hayes 1200B Modem $425
Anchor Signalman 1200baud Modem $275
Quadram Color I Board $199
Quadram Color II board $235
STB Graphics Board $285
256 K Ram Board $299
Princeton RGB Hi-Res Monitor $479

Our Printer Prices Are Lowest in U.S.!
Call for prices on Epson, Okidata, Gemini, Blue Chip, Toshiba, Diablo, NEC,Juki and Daisywriter 2000 Printers.

COMPUTERS
Corona, Zenith, and Televideo, portable or desk tops ..... Call

TERMS: Prices include 3% cash discount. Add 3% for charge orders. Shipping on most items $5.00. AZ orders +6% sales tax. Prices subject to change.

TOLL FREE ORDER LINE 1-800-421-3135
WAREHOUSE DATA PRODUCTS
2701 West Glendale Ave., Suite 6
Phoenix, AZ 85021



BRING OUT THE GENIUS IN YOUR PC.

Now you can do it, with Sigma Designs' Expansion system. Raise your personal computer's I.Q. to XT level and beyond. Sigma gives you room to expand with almost twice the capacity of any other system on the market. Yet its quality, performance and versatility can be yours, for much less.

E = MC² (Expandability = More Capabilities²)

The Sigma Expansion Chassis provides 9 card slots, room for two full height 5 1/4 inch disk drives, and a heavy duty power supply. Thanks to its DMA support, all commercially available expansion cards can be installed, including those with memory. The chassis' easy installation, attractive design and rugged construction make it the perfect complement to any system.

Relatively Speaking, We've Got A Drive For Every Need

Upgrade your PC to an all powerful tool. As a sophisticated disk subsystem, our chassis can be configured with any of the following storage devices (photograph, left to right): Streaming Tape Back-Up (20, 40, 60MB); Half Height 10MB Hard Disk Drive; Half Height 2.8MB Floppy Drive with preformatted media for back-up (it can also read standard 48/96 TPI diskettes); Full Height Winchester Hard Disk Drives (10, 15, 33MB).

ISN'T IT TIME YOU HELP CHARLIE GRADUATE?

SIGMA DESIGNS

SIGMA DESIGNS, INC.
2990 Scott Blvd.,
Santa Clara, CA 95050
(408) 496-0536

CIRCLE 187 ON READER SERVICE CARD

MICROcentre™ Work Stations

Engineered to Optimize Business Efficiency

Microcentre™ workstations are the ultimate choice of any business where operating efficiency is as essential as computer power.

Within seconds Microcentre opens your business day, ready to give you full command and comfortable access to your system, with all components positioned at your fingertips.

A conveniently located surge, spike and noise protecting power center* allows you to activate your entire computer system at the turn of a switch. *Now you're ready for a productive business day!*

With the same ease used to access your computer you can confidently exit your workstation by locking your valuable hard- [illegible] European [illegible]

[illegible] features, each M[illegible] the use of [illegible] space and can be readily relocated to give maximum flexibility for your computer use.

Since you cannot select the right workstation unless you have a choice, Microcentre offers a variety of models and colors in premium quality laminates and beautifully hand-finished woods to meet your specific requirements.

The unparalleled efficiency and superior quality of Microcentre guarantees a sound investment and a workstation you can depend on.

* Optional in Model 104

EXECUTIVE 102 (Walnut)

$1195 (Sugg. retail)

Model 103

$995 (Sugg. retail)

Model 104 NEW!

$595 (Sugg. retail)

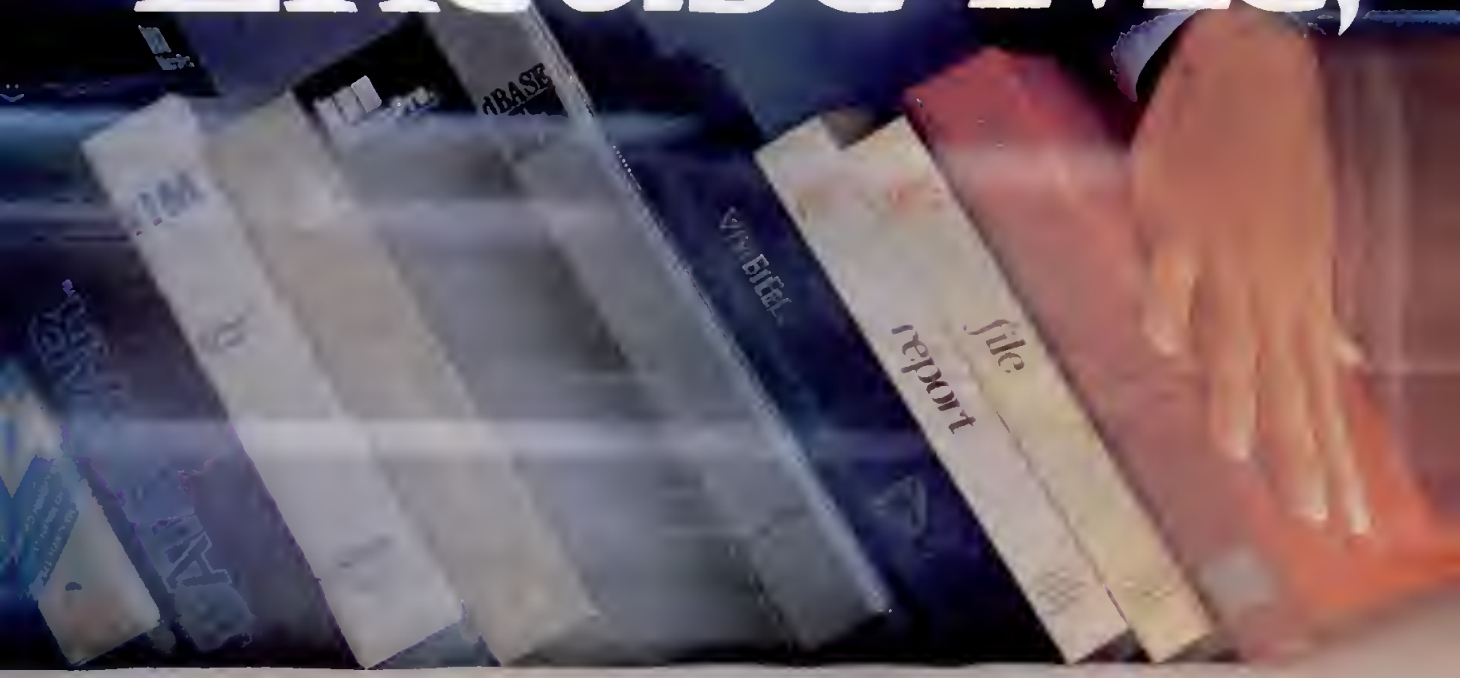
Continental Engineering Group, Inc.

Patent Pending

For more information call Continental Engineering Group Inc. or your local dealer:
Outside California 1-800-821-6279
Calif. (818) 350-8371
Dealer inquiries welcomed.

CIRCLE 265 ON READER SERVICE CARD

"Excuse Me,



Make Way For Hayes' Please.

An advanced, easy-to-use data management system for the IBM® PC and compatibles.

Want to get your paperwork out of a clumsy file cabinet and onto your PC's screen, where you can manage it better? Frustrated with data base software that's either too limited or too difficult to use? Hayes offers you a simple word of kindness.

Please.™ A powerful, yet easy-to-use, system for organizing and managing your information. *Please* is flexible enough to store any data you enter, and it'll return data to you in exactly the form you need. *Please* does more. It does it all faster. And it's sure to please!

"The menu, Please?"

Menus list all your options and tell you exactly which keys to press for every *Please* feature.

That's to be expected. As the telecomputing leader, Hayes built its reputation on quality design, reliability and customer support. Now these same standards have been applied to a new data management system that is going to instantly change the way you do business!

Say you're looking for an efficient way to maintain sales data. *Please* leads you every step of the way in creating a sales database that might include names, addresses, dates and figures. These categories are called "fields" in database lingo, and they're the very heart of your database structure.

"Make it snappy, Please!"

Need a report fast? You and *Please* can put together a Quick List in a matter of seconds.

Want last month's total in a particular region? Press a few keys and it's yours! A few more keystrokes and you'll know who's moving product, and what's your biggest seller.

Please will supply you with labels for a mailing to selected customers. It can send customer information to your word processor for a promotional letter. And it can receive data from your spreadsheet program. *Please* will even look up a name and company for you, your Hayes Smartmodem* will dial the phone number, and you're ready to talk!

Taking this same sales database, you might also want to define special fields for a custom Output Plan. With a defined field for "COMMISSIONS DUE," *Please* can automatically compute each salesman's commissions, and print them out in a report of your own design. All this and more, just for saying "Please."

And if you ever change your mind and want to change the structure of your database, please feel free. Step-by-step instructions show you how.

You have the same flexibility with any database you and *Please* design. You can store up to 16 million records and 200 custom Output Plans for each database! More than you're likely ever to require. But isn't it nice

Please is a trademark of Hayes Microcomputer Products, Inc. * Smartmodem 300, Smartmodem 1200 and Smartmodem 1200B are trademarks of Hayes Microcomputer Products, Inc.

Please."

"Put it here, Please."
Design a special screen format to position data in a particular place.

knowing all that storage power is there? Just in case you ever need it?

Now you might think that a data management system that does all this must be difficult to use. Right? Rest assured. *Please* works hard so you don't have to. An easy-to-follow sample disk shows you everything you need to know to create your first database. Three *Please* menus show you which keys to press to access every feature. And whenever you need it, *Please* provides on-screen HELP messages, tailored to a specific task. So you needn't waste time reading through a list of unrelated instructions on your screen. Or stop what you're doing to consult a manual. In no time at all, and with no assistance at all, you'll be a *Please* database pro!

"Merge these, Please!"
Combine data from one database into another, without changing your original.

Everything about *Please* is designed to save you time and effort. So what could make data management even easier? *Please Application Templates*, that's what!

To help you get up-and-running immediately, we've developed a series of practical, pre-designed templates. You'll appreciate their well-thought-out structure, and "fill-in-the-blank" ease. Choose several! For business and personal use. Including *Mailing List*, for storing names and addresses and producing mailing lists. *Contacts*, for managing facts and figures about your sales contacts. *Applicants*, for following applicants throughout the interviewing process. *Appointments*, for maintaining your calendar and tracking all of your business expenses. *Household Records*, a complete home management system. And more! Your dealer has details!

Buy *Please* now! Get a FREE *Mailing List* template from your dealer.

Second FREE template of your choice, direct from Hayes!

Help yourself. Please! And take advantage of these two valuable offers. See your dealer right away!

Hayes™

Hayes Microcomputer Products, Inc.,
5923 Peachtree Industrial Blvd.,
Norcross, Georgia 30092. 404/441-1617.

CIRCLE 166 ON READER SERVICE CARD

IBM is a registered trademark of International Business Machines Corporation ©1984 Hayes Microcomputer Products, Inc.

HARDWARE • BARBARA KRASNOFF

CP/M and DOS: At Home in the Kaypro 4 Plus 88

The Kaypro 4 Plus 88 may not be sleek or elegant, but it's an inexpensive, workable combination of CP/M capability and at least a limited amount of DOS compatibility.

Photograph Geoff Spear. Furniture design by Robert Venturi, available through Knoll International, NY.

KAYPRO 4 PLUS 88

The battle for supremacy between DOS and CP/M started when the IBM PC was introduced in 1981. Despite the remarkable success of the PC (and DOS along with it), and despite more than a few premature predictions of CP/M's demise, CP/M is still going strong. The operating system battle shows little sign of ending soon, but a few computer companies, on both sides of the front, are calling for a truce by producing machines and/or software that are acceptable to both types of operating systems. One of the latest machines to attempt this compromise is the Kaypro 4 Plus 88.

The Kaypro 4 is essentially a CP/M system microcomputer. It uses a Z-80 CPU with two 5¼-inch double-sided, double-density disk drives with 400K of storage each. The "Plus 88" means the Kaypro 4 has added a coprocessor board with 256K memory, which, under CP/M, can act as a RAMdisk. It also enables the Kaypro 4 to be used as an Intel 8088 with that same 256K memory.

Physically, the computer's appearance is rather startling. During the last few years, the trend has been toward packaging microcomputers in cases with clean plastic lines—preferably in tan or beige. Somewhat defiantly, the Kaypro's stark, retro-tech, military-gray metal box harks back to World War II.

Portable?

Like other Kaypro computers, the 4 Plus 88 is "portable" in the sense that it is about the size of a small sewing machine, weighs about 27 pounds, and comes with a carrying strap. It is propped up to a comfortable viewing height by a thin metal stand that folds out from the bottom and has a tendency to collapse if you accidentally push the computer in the wrong direction.

The front of the machine is protected by a shallow metal hood, presumably there to reduce screen glare. The computer has a 9-inch green monochrome monitor, two horizontal, half-height floppy disk drives labeled A and B, and a rather large red light that lets you know when the computer is in operation. It also has the usual smaller red lights on the disk drives; at least one light is always on, indicating the last drive that was in use. This can be disconcerting if you're trying to determine whether the drive has stopped running.

The keyboard opens from the front in much the same way the keyboard on the Portable PC does, except that the Kaypro's keyboard is held in place by two plastic hinges on the sides. Made of molded metal, the keyboard connects, via a clip attachment, to the back of the computer and sits on a comfortable, but nonadjustable slant.

Journalist's Favorite

Kaypro computers have become extremely popular with journalists and writers for several reasons. One is that the screen, although small, is very clear, and the 80 × 24 character display puts as little strain on the eyes as possible with this type of computer. Another reason is that the company's keyboards, including the 4 Plus 88's, are laid out in time-honored Selectric fashion. Anyone used to an electric typewriter will have no problem adjusting to the Kaypro 4 Plus 88.

Users accustomed to an IBM PC, however, may find the keyboard's format a bit puzzling. Like other CP/M microcomputers, it lacks function keys and an Alt key. In order to reboot, you must use the Reset button on the CPU itself (although hitting Ctrl-Del occasionally works, too). Also there is no Break key, so you must use Ctrl-C to break out of a program. Finally, the cursor keys are lined up in a row along the upper right-hand side of the keyboard. I found this arrangement terribly confusing; my fingers are much happier with the more logical North-South-East-West format found on most microcomputer keyboards.

The Reset button (which reboots the machine automatically, taking the place of the more familiar Ctrl-Alt-Del) is a marvelous idea and is worthy of consideration by other computer companies. However, the button is inconveniently located on the back of the computer, so that every time I had to reboot, I had to reach uncomfortably over to the back of the machine. (This awkward placement might have been chosen to avoid "accidental" reboots, but any location not directly on the keyboard would have served that purpose.) The monitor brightness knob is also on the back, as is a serial printer or modem I/O port and a parallel printer I/O port.

Kaypro is known for providing a nice variety of software with its computers, and the Kaypro 4 Plus 88 is no exception. Along with the CP/M and DOS system disks, the package includes S-BASIC, CBASIC, and BASIC-80; *WordStar*, *Word Plus*, and *Perfect Writer/Speller* with tutorials; *Perfect Filer* and *Perfect Calc;* and *Sup'r Terminal*, a modem program. These are all CP/M programs. All the manuals come in neat, bound books—no binders. The only exception is the photocopied addendum to the user's manual, which contains the extra instructions and directions needed for the 4 Plus 88, including how to install and use the DOS functions.

What About DOS?

The DOS functions are what make the computer so interesting. But the conversion of the Kaypro 4 into a DOS-compatible computer will not necessarily make serious DOS users happy. It goes without saying that a machine that needs to have its CP/M system running in order to boot DOS is bound to have some drawbacks. Since I was exclusively interested in testing the Kaypro 4 Plus 88's DOS capabilities, I devoted most of my time with the machine to examining its use of that oper-

Kaypro 4 Plus 88
Kaypro Corporation
533 Stevens Ave.
Solana Beach, CA 92075
(619) 481-4300
List Price: $2,495

CIRCLE 749 ON READER SERVICE CARD

ating system. And I immediately ran into problems.

In order to boot up DOS, you must use three separate disks. According to the addendum to the manual, the procedure should go like this: First, after you turn on the machine, you get a message that asks you to please place your diskette into the A: drive. You then boot up CP/M. Once that is done, you remove that disk and insert the CP/M To DOS disk and type:

```
MSDOS.
```

You then insert the DOS disk, and you're (finally) in business.

With all due respect to the addendum, I found that the machine was just as happy booting up from the CP/M To DOS disk, thus reducing my juggling act by one-third. However, "just as happy" is a relative term here—it took an average of three reboots for the first CP/M boot to "take," an experience I found rather frustrating. And, of course, if you are working in DOS and suddenly need to reboot, you've got to go through the whole procedure all over again. (In fairness, I must mention that I later discovered that the rebooting problem was due to an easily fixed loose connection in the wiring.)

According to that same addendum to the User's Guide (dated March 14, 1984), to format a disk for MS-DOS, you are supposed to type:

```
FORMAT B:/D/S
```

where the D indicates a double-sided disk. However, when I tried to follow the instructions, the Kaypro 4 Plus 88 kept telling me to put the DOS disk in the A: drive. Since I was under the impression that the disk was already there, I called Kaypro's software support people and asked for advice. I was told not to type in /S—for some reason, the system command simply didn't work. Apparently, the idea is simply to format (using /D) and then, if you need any other files on the disk, copy them.

I did so and then attempted to diskcopy the DOS disk onto the newly formatted disk. The computer told me that it couldn't oblige—that the source and target disks did not have the same format. Another support person at Kaypro told me that all of the Kaypro 4 Plus 88's DOS disks had been sent out on 8-sector diskettes and therefore could not be copied onto 9-sector diskettes. The suggested solution was to do a COPY *.* (which copies all the files on the disk).

While the Kaypro's 8088 can perform pure MS-DOS functions, it can't really simulate the PC environment.

Smoother Sailing

Luckily, the rest of the testing went more smoothly. The Kaypro ran MS-DOS 2.0 and PC-DOS without a murmur and also had no objection to *dBASE II*. It would not run *WordStar* or any of the BASIC systems that were available. According to Kaypro, it will run properly configurated GWBASIC and Version 3.3 of *WordStar*, among other DOS programs. The Westico Company, a software producer, has manufactured a series of over 100 packages that will run on the Kaypro 4 Plus 88. Kaypro's support people can supply a listing of that software.

Westico supplied two examples of DOS software usable on the Kaypro 4 Plus 88: *WordStar* and BASIC-86. The *WordStar* program ran without a hitch, although the machine did seem to linger over each command, and a short paragraph typed on the Kaypro ran with little trouble on a PC. BASIC-86, which is a form of BASIC usually reserved for 16-bit CP/M microcomputers, also ran well on the Kaypro's DOS system. However, since this form of BASIC is not usable on most DOS machines, it could not be said to add much to the Kaypro's compatibility.

In fact, the computer seemed quite balky when it came to most DOS programs. It tackled unexpected problems in one of two ways: either by running aimlessly for a few seconds and then giving up entirely (necessitating a full reboot) or by having at least some compassion and returning to the DOS prompt.

The Reason Why

Once you remove the ten screws that attach the top of the Kaypro 4 Plus 88, you can see how cleverly the people at Kaypro have arranged their computer—and why its DOS capabilities are so limited.

The main board of the computer, which lies horizontally across the top, normally holds the Kaypro's Z-80 microprocessor. However, for the 4 Plus 88, Kaypro has instead plugged a much smaller miniboard into the socket. It holds the Z-80 chip and acts as a buffer or switch.

A bus cable leads from the Z-80 "daughterboard" to another board on its right. This 5½ × 7-inch construct is another computer—it holds the 8088 chip and 256K of memory (two 128K boards stacked on top of one another). When the machine is running DOS, the 8088 board is doing the work, and the Z-80 board is performing only I/O functions.

However, while the Kaypro's 8088 can perform pure MS-DOS functions, it can't really simulate the PC environment. It cannot perform any tasks that require direct interaction with the video controller, direct memory access, or serial communications. It also is totally incapable of anything requiring graphics. This deficiency accounts for the problems with most MS-DOS software.

The Kaypro 4 Plus 88 is an interesting and cleverly crafted microcomputer, and it should be of use to those who work primarily in CP/M but want some access to DOS. However, owing to the inherent nature of the machine, that access is severely limited, and it takes a bit of imagination to refer to this computer as "PC-compatible." ■

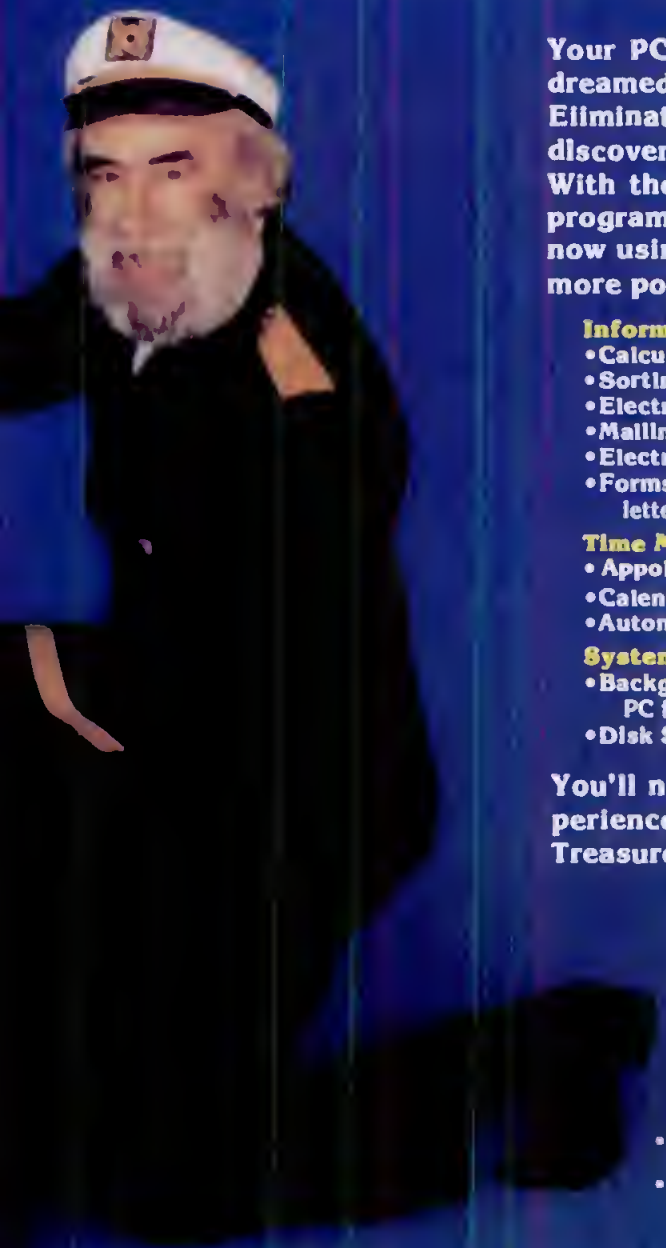
Treasure Chest™ of Software

*jr*Captain™ and 1stMATE™

TECMAR

the power behind the PC™

with Tecmar's Captain™, multifunction boards



Your PC can finally do all those wonderful things you've dreamed about — with the Treasure Chest of Software. Eliminate the need for many desk top accessories when you discover Tecmar's new easy to use software technology. With the press of a key you access many Treasure Chest programs without having to exit from a program you are now using. This Treasure Chest of Software gives your PC more power for:

Information Management
- Calculator
- Sorting Program
- Electronic Rolodex*
- Mailing List
- Electronic Notepad
- Forms Generator - create letters, labels & reports

Time Management
- Appointment Alert
- Calendar Generator
- Automatic Time and Date

System Improvements
- Background Printing - frees PC for other work
- Disk Simulator in RAM

Hardware Diagnostics
- Memory Diagnostics
- Printer Diagnostics
- Clock-Calendar Diagnostics

Information Security
- Confidential File Coding

Use at Home
- Checkbook Balancer
- Inventory Management
- Banner Generator - prints letters 4.5 inches tall
- Tic-Tac-Toe
- and more !

INTRODUCTORY OFFER

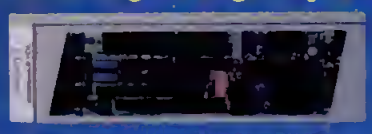
*Rolodex is a trademark of The Rolodex Corp.

You'll never want to turn your computer off once you experience the ease of use, efficiency and enjoyment of the Treasure Chest of Software.

For the IBM PC: Captain & 1stMATE

- 0 to 384 KBytes of Memory on the Captain Board
- 0 to 256 KBytes of Memory on the 1stMATE Board
- Clock-Calendar with battery
- Serial Communications Port
- Parallel Printer Port
- Treasure Chest of Software

for the PC*jr*: the *jr*Captain



- 0 to 128 KBytes of Memory
- Upgrade to 512 KBytes with addition of *jr*Cadet Board
- Clock-Calendar with battery
- Parallel Printer Port
- Treasure Chest of Software

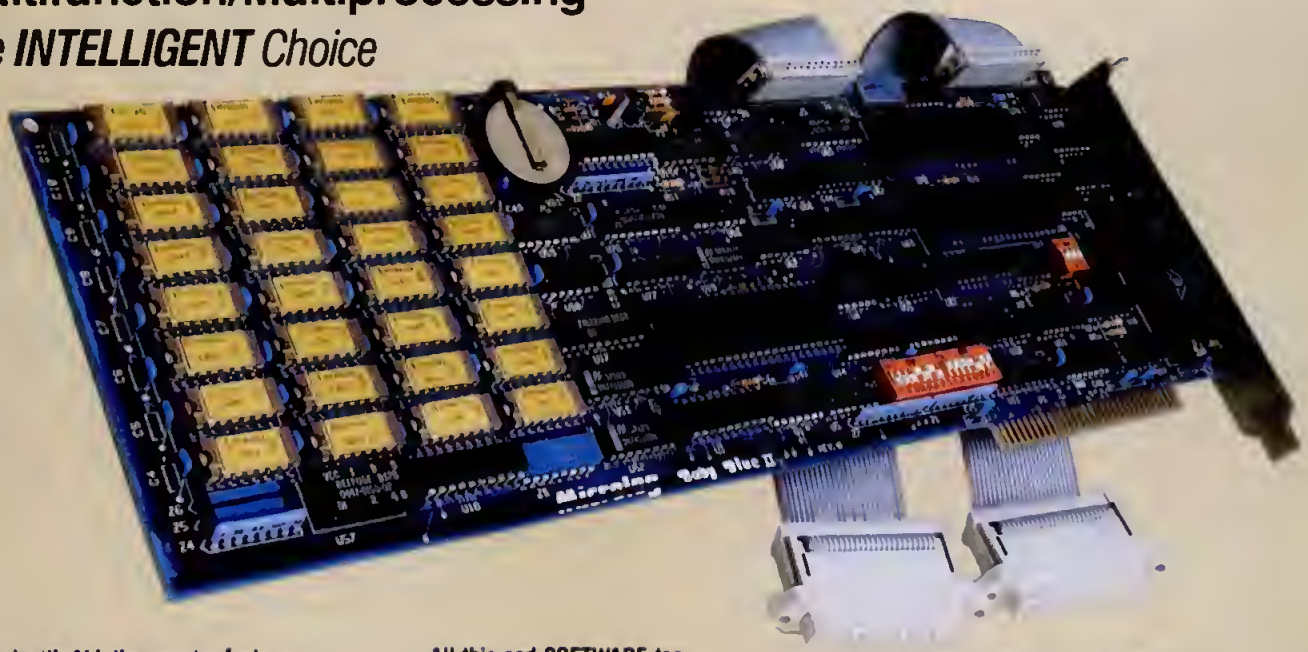
Tecmar, Inc. 6225 Cochran Road Solon (Cleveland), Ohio 44139-3377
Phone:(216)349-0600 Telex:466692

CIRCLE 501 ON READER SERVICE CARD

Baby Blue II

Multifunction/Multiprocessing

*The **INTELLIGENT** Choice*



Packed with ALL the popular features:

- Up to a **256 Kilobyte Memory Expansion**, optional in 64K blocks.
- **Clock/Calendar** with long-life battery back-up (choose replaceable or optional rechargeable battery).
- **Parallel Port** for use with IBM/Epson and most other parallel printers (addressable as LPT1: or LPT2:)
- **Two (2) Serial Ports** addressable as COM1: and COM2:, OR use our unique extended port addressing to configure for serial devices other than COM1: and COM2: (i.e. pointing devices, graphics tablets, etc.)
- **Baby Blue II** is fully compatible with the IBM PC, the PC/XT and other compatibles, including the Texas Instruments Professional Computer.

Not just another DUMB multi-function board.

With all that hardware to manage, we think a board should have a brain. You won't find this feature on other boards – they may look pretty, but they can be pretty boring once you get them home. Baby Blue II is actually a second computer inside your PC, built around the high-speed Z-80B microprocessor.

- **Background Processing:**
  Compile, assemble, sort, calculate, communicate or print – all in the background, while you and your PC continue to work on other tasks in the foreground. Because it is a separate computer, Baby Blue II performs these functions without slowing down your PC, helping you to do more work in less time.
- **Autostart at Preset Time:**
  Baby Blue II can begin any task, even a background operation, at a specific time by consulting the on-board real-time clock.
- **CP/M Capability:**
  Baby Blue II offers instant access to the vast CP/M-80 library of mature, professional software for every conceivable application.
- **Dual Ported Memory and I/O:**
  You can use Baby Blue II's memory, ports and clock as ordinary enhancements to your PC. Or, you can let our Z-80 micro-processor control the board directly, for truly independent back-ground operation.

All this and SOFTWARE too . . .

Systems utilities

PDQ RAMdisk Software: create a FAST pseudo-disk drive of any size in available system RAM. The DOS 2.0 version lets you change the size of your RAMdisk from the keyboard.

Print Buffer/Spooler: a TRUE print spooler: the Z-80 buffers and manages printing independent of your PC. Unlike other so-called "spoolers", this one won't stop your printer or slow you down when you start another job.

Clock Software: sets Baby Blue II's clock and initializes the system clock at boot time – never type the time and date again!

Communications

Smart Terminal Emulator Package (STEP): talk to other microcomputers or connect to larger host computers, as an asynchronous terminal through Baby Blue II's serial ports. Unlike other "smart terminal" programs, STEP offers full emulation of popular video display terminals (the standard package includes Televideo 950 and Hazeltine 1500.
IBM 3101, OEC VT100 and many others are optionally available). You can send or receive text files, and with STEP's unique Sessions Menu, changing your contiguration is a keystroke away.

BSTAM File Transfer Utility: Transmit and Receive text, HEX, and binary files (including .COM files) without errors and without fuss. BSTAM is easy to use, with all configuration parameters handled transparently under STEP.

CP/M-80 compatibility

Baby Blue Conversion Software: Microlog's famous CP/M Emulator turns CP/M-80 programs into PC-DOS programs for fast, efficient execution on Baby Blue II. Completely transparent operation using standard PC-DOS commands – freely mix PC-DOS with CP/M programs and text/data files on the same PC-DOS disks.

Convert: supports bidirectional file transfer between PC-DOS and popular CP/M disk formats.

Keyfix: automates your keyboard with 54 programmable function keys for CP/M programs, eliminating tedious typing chores (max. 80 characters per key).

Baby Blue II (64K Installed) . . . . . $ 695.

QUALITY you can count on . . .

Microlog is in the business of producing high quality, intelligent computer peripherals. Extensive factory testing gives our products one of the highest reliability rates in the industry. The finest components, connectors, and multi-layer PC board design, ensure years of trouble-free operation. We back all our products with a 90 day warranty and full technical support.
For more information on Baby Blue II and other fine Microlog products, see your microcomputer dealer or contact us:

Microlog™
A TU INTERNATIONAL COMPANY

Microlog, Inc.
222 Rte. 59
Suffern, NY 10901
(914) 368-0353

CIRCLE 516 ON READER SERVICE CARD

Baby Blue II is a trademark of Microlog, Inc
CP/M is a registered trademark of Digital Research, Inc.
BSTAM is a trademark of Byrom Software, Inc.
IBM is a trademark of you know who
©1983 Microlog, Inc.

PROJECT: DATA BASE

Part 5

PC Magazine continues its seven-part investigation of the database packages available for the PC. Here we review the first batch of Category 3 products.

All along we've been describing the database project as a six-issue series. But as we were looking over the articles on the Category 3 packages, we realized that each article was bursting with details of the myriad features of each product and replete with the opinions, likes, and dislikes of our various authors. We couldn't bear to omit any of this information. Not all of the Category 3 articles would fit into one issue—so now Project: Database carries through seven issues. The Category 3 databases, those with a procedural language, are described in this *and* the next issue!

A procedural language is more than just a query language. While a query language allows users to ask questions about the contents of the database, a procedural or programming language enables them to use a set of criteria to dynamically control the processing flow.

In some packages, the distinction between a query and a programming language is blurred; the software uses a hybrid language that has characteristics of both types. Nevertheless, the inclusion of any procedural elements puts a database package in the running as a serious business tool and makes the step from Category 2 to Category 3 a huge leap in complexity and power.

—Stephanie Stallings

Photograph: Dennis Chalken

FORMULA II: A Learning Experience

```
LAST NAME: Banning

EMPLOYEE NUMBER: 593830

DEPARTMENT NAME: Marketing


LAST NAME: Bradford

EMPLOYEE NUMBER: 694030

DEPARTMENT NAME: Marketing


LAST NAME: DiMeara

EMPLOYEE NUMBER: 194067

DEPARTMENT NAME: Data Processing
```

A sample *FORMULA II* report of employee and department information.

FORMULA II is an "application creator"—a collection of program modules that you weave together into what you hope will be a useful application program. Because *FORMULA II*'s ready-made program modules may not be sophisticated enough for certain applications, the package includes a system programming language that you can use to issue commands such as LOOP and READ NEXT RECORD, just as you might include analogous commands in a BASIC or Pascal program.

FORMULA II's developers clearly have come from a mainframe computer environment. Many of their design concepts draw on the manner in which mainframe programmers create large databases and application systems. Since *FORMULA II* is written in C, applications developed on a 16-bit machine under one operating system can be loaded and used on an 8-bit system very easily, according to the manufacturer. The documentation indicates that it is possible to run *FORMULA II* on machines using CP/M, CP/M-86, MS-DOS, or TurboDOS and employing Zilog Z-80, Intel 8088 and 8086, or Motorola 68000 central processors. Multiuser systems with these operating systems can also be accommodated by *FORMULA II*. A program called SETUP is used to install *FORMULA II* for each of these different machines.

FORMULA II comes on two disks, the Designer Disk and the Application Disk, that contain all the files necessary to design, develop, and save database application systems.

To boot the program, simply enter the word *formula* and the A> prompt. The *FORMULA II* command processor screen will appear, containing the prompt Command to Execute, to which you must respond by typing in the name of a particular *FORMULA II* program module. If you intend to set up a data file, you need to use the FILEDEF program module, which enables you to specify the types of data you want to use in a file.

Defining a Database

After you enter the FILEDEF command, a numbered menu gives you a range of options. Type D for database to begin entering the data field definitions. You supply a field name and then fill out a list of other field parameters: the field type, field length, upper and lower values for the field (which control the minimum and maximum values that can be entered in an application), number of decimal places floating-point numbers will have, and a special "restrict" parameter that controls the type of data that can be entered (N means that only numeric data can be entered and Y permits alphanumeric data, for example).

The data types allowed in a *FORMULA II* field definition include the usual alphanumeric, date, and numeric-only values; there is one extra option—the asterisk.

Like many other database systems, *FORMULA II* does not allow you to add fields to a file after information has been entered. Any attempt to do this will destroy all stored data. While this may be no problem with a small file, the prospect of re-entering 50 or more records is daunting. *FORMULA II* allows you to create dummy fields in a file by using an asterisk as the field type descriptor. These spare fields can be converted to real fields, without destroying file integrity.

After creating all the fields you need, you can set up an index for the file. When the prompt Key Field name appears, you can type in the field name that will act as the primary index key and the number of characters that should be used when indexing records. This latter feature allows for

FORMULA II
Dynamic Microprocessor Associates
545 Fifth Ave., #1103
New York, NY 10017
(212) 687-7115
List Price: $695
Description: Relational
Requires: PC-DOS 1.1, 128K RAM, two disk drives.
Records per File: 999,999,999

CIRCLE 743 ON READER SERVICE CARD

Illustrations: Phil Anderson

quick indexing by the first two characters of a last name, for example, versus a more complete but slower index by the whole length of the last name. *FORMULA II* does not actually sort the records in files; it simply sets up a separate index file that contains all the information needed to store and retrieve records in some user-defined sequence.

A second prompt, Field Name for Second Part of 2 Part Key, allows two records with the same last name to be distinguished by their first names.

Importing with UPDATE

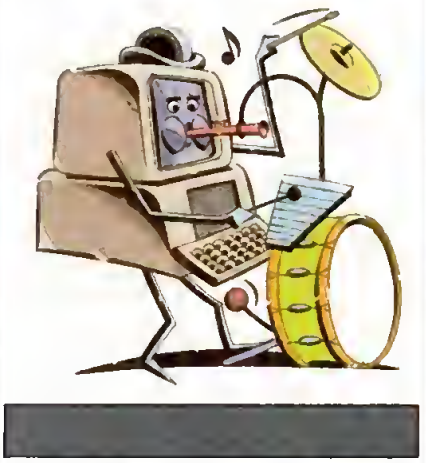
According to the documentation, *FORMULA II*'s UPDATE feature can be used to transfer data from one file to another under certain conditions and with variable effect. You type the word *update* on the first line of the multilevel command line and then fill out the rest of the lines as shown below:

```
Program name:UPDATE
Parameter    :EMPTYFILE
Drive 1      :B
Parameter 2  :DATAFILE
Drive 2      :B
Option       :A/C/D/R/X
```

You have a choice of five different options in the last line. The A option adds a new record to EMPTYFILE from DATAFILE only if the records in DATAFILE do not exist already in EMPTYFILE. C copies records from DATAFILE into EMPTYFILE, creating completely new records as the update proceeds. The two files do not need to contain related fields. D deletes EMPTYFILE records that are contained in DATAFILE. One record is deleted for each record in DATAFILE. R allows a "reverse update"; the master file EMPTYFILE can update the transaction file DATAFILE, but only when fields in the two files have been related. Finally, X extends EMPTYFILE with new records from DATAFILE, regardless of whether some of the records already exist in EMPTYFILE.

One final option, not indicated above, is to leave the final line blank. This is a normal update procedure; it rejects records in DATAFILE that do not already exist in EMPTYFILE.

I initially tried to use the C option to import the ASCII files supplied by *PC Magazine* into *FORMULA II* files that I created using the FILEDEF procedure. At first, the operation seemed to have worked, but after listing the file contents, I realized that something was wrong; every



record that had been imported was marked for deletion. I undeleted each record which caused the first line of each to be wiped out. It turned out that the import process was a little more complicated than the normal UPDATE procedure.

First you must create what *FORMULA II* calls an external file that contains all the fields the final file should possess. The second step is to create an internal file, which the program calls a database file, with exactly the same field parameters. Finally, you must rename your ASCII file so that the first eight characters match the external file you created and the extension is .EXT.

The UPDATE procedure looks first for the empty intermediate file that you created and then moves on to the .EXT file that actually contains ASCII format data. After reading the first ASCII record, UPDATE transfers it to the *FORMULA II* internal database file.

This method of importing data worked, and it took about 21 minutes to import approximately 45K of data. The only practical limitation is that your ASCII file must consist only of data field contents separated by spaces and line feeds. Files with special delimiters such as double quotation marks and commas are difficult to import; most users will not want to perform the special formatting work that is necessary. However, data from *FORMULA II* files can be exported with any special ASCII characters embedded.

To look at the data in a file, or enter new data, you must use the FILEPROC procedure. If you want to browse through all the records or look for a particular record, FILEPROC will read the specified file sequentially until it finds the required record.

Alternately, you can ask FILEPROC to look for data stored in an associated index file before it retrieves any record. If it finds an index file, FILEPROC identifies the keys that have been set and asks you to enter the exact value of the key fields it should use to find a match in the data file.

To look at data from more than one file, you can use *FORMULA II*'s linking facility. You will generally want to link file fields in *FORMULA II* applications when you have one file designated as a transaction file and another designated as a master file. The transaction file can then be used on a daily basis to record such events as bills paid or employees promoted. At a regular interval—every week or month—you can use this transaction file data to update the master file. The links are set up via the same screen with which you created individual field definitions earlier.

Along the bottom of the field definition screen is a separate area where you enter linking information. If you had just defined a field called LNAME in the transaction file and wanted to link it to the masterfile, the bottom section would look something like this:

```
Related File Update Data
File          Field   Opr
Masterfile    LNAME    R
```

This message indicates that data stored in the LNAME field of the transaction file should replace the data stored in the LNAME field of MASTERFILE whenever you go through an update procedure.

Transaction fields also can be added or subtracted from master fields (numeric data), or they can force the UPDATE procedure to search for a key field in the master file that matches the transaction file field value.

As the *FORMULA II* documentation correctly points out, "the 'bottom line' of an applications software system is the data it produces." In addition, the system, not the user, should perform all the contortions necessary to produce good quality output.

To try and make things easier, *FORMULA II* includes a query language procedure that lets you extract selective information from individual data files without resorting to a report generator. The query language attempts to look as much like English as possible, and you can have your entries checked for validity by QUERY itself before they are executed. If you want to list a file on the computer display, you can type in:

```
DISPLAY DUMMYFILE, DRIVE B
```

To be more selective, you could enter:

```
DISPLAY DUMMYFILE, DRIVE B,
SHOW FNAME, LNAME, ADDR,
CITY, STATE
```

In this case, the program will display only those fields specified after the word *show*. Instead of *show*, you could also use the words *showing* or *include* to achieve the same results. The QUERY procedure ignores all punctuation.

Additional QUERY commands allow you to retrieve only record fields that meet specific values or fields that meet or fall within some logical condition. You can save a query string as a named disk file and invoke it whenever you need it.

You can also use QUERY to index files by any field name or combination of field names. The following sentence will create a file called CITY.IDX on drive B: for DUMMYFILE:

```
DISPLAY DUMMYFILE, DRIVE B,
BY CITY, SAVE
```

The word *save* tells *FORMULA II* to store as a disk file what would normally be the transitory index, held in main memory during the life of the query. Indexes can be nested to let you access a file by a combination of keys.

I found the QUERY procedure easy to use, if a little long-winded at times. Saving regularly used queries in disk files and using the free-form query language only for ad hoc inquiries seems the most sensible approach. And while punctuation is not compulsory, there is little merit in leaving it out; if you do, you may find it difficult to follow your own query strings.

The QUERY procedure is easy to use, if a little long-winded at times.

Report Generation

The FORMDEF and FORMPROC procedures are used to create reports. You enter FORMDEF via the main command line screen and select the Edit A Form option from a submenu. Next, you are asked whether you want to change the standard form parameters and whether you wish to change the names of the files that will be used in creating a form. The latter option allows you to include data from up to six files (one main file plus five other related files) in a report form.

By using a combination of main file field, related fields, and memory variables in a form, it is possible to produce satisfactory reports. With some extra effort, however, you can create reports that are quite impressive. The unusual thing about FORMDEF is that it embeds procedural language into the report format. You can place loops, READ NEXT commands, logical tests, and math routines in between or actually tagged to fields.

As the flow of control progresses downward, these special statements are encountered and acted upon. A field may be printed a number of times before the next field is dealt with, completely new output fields may be created to display math calculations, or nothing may be printed until a special condition is met.

After creating and saving your FORMDEF file, you must use the FORMPROC procedure to preprocess or compile it. FORMPROC is a two-pass compiler that readies a form for printing and also compresses the data so it takes up less space on disk. Since compiled forms are unreadable by normal means, you can create applications that cannot be tampered with.

However, you must put a considerable amount of effort into learning the FORMDEF "language" before you can develop really useful applications. The novel idea of embedding programming commands among the fields that compose a screen display gives new meaning to the phrase "reading between the lines."

Adult Education

Because of the time it took me to become adept at the FORMDEF language, I was unable to complete the tasks set by *PC Magazine*. *FORMULA II* clearly can handle those tasks easily—once you've given yourself a thorough education in the program's procedures.

FORMULA II's powerful features make it fun to work with. However, the method of developing report form programs is too cumbersome. The QUERY language is useful, but it would have been more so if data could be extracted from more than one file at a time.

If you're dedicated enough, you could do a great deal of good work with *FORMULA II*, and in the process learn more about programming than you intended.

—**Robin Webster**

MANAGER: A Procedural Pro

EMPLNUM	SALARY	CHANGEAMT	CHANGEMONTH	CHANGEDAY	CHANGEYEAR	PCTINCREASE
120390	30000.00	4200.00	10	18	82	16.3
120740	56300.00	6000.00	3	1	75	11.9
121020	34000.00	1900.00	2	24	81	5.9
121300	20000.00	6500.00	12	9	80	48.1
121300	25000.00	5000.00	2	1	82	25.0
121580	25000.00	8300.00	6	6	82	49.7
121580	35000.00	10000.00	1	10	83	40.0
121580	50000.00	15000.00	2	18	84	42.9
121790	19500.00	6000.00	5	1	81	44.4
122140	30000.00	4200.00	10	18	82	16.3
122490	56300.00	6000.00	3	1	75	11.9
122770	34000.00	1900.00	2	24	81	5.9
123050	20000.00	6500.00	12	9	80	48.1
123050	25000.00	5000.00	2	1	82	25.0
123330	25000.00	8300.00	6	6	82	49.7
123330	35000.00	10000.00	1	10	83	40.0
123330	50000.00	15000.00	2	18	84	42.9

This report shows the dollar amount and percent increases calculated with a 2-line *MANAGER* procedure.

It's a rare treat when a software package not only offers better features than the industry leaders, but offers them at a lower price. After giving *MANAGER*, from Call Manager, Inc., a workout, I concluded that this database offers more commands and more ways to implement them than most database managers on the market today, and all for $195. That is a real price/performance bargain.

MANAGER has been in use on minicomputers for over 13 years and was introduced for the IBM PC last year. The result of 13 years of attention and use is a mature database system.

To run *MANAGER* you need to have an IBM PC, XT, or IBM workalike with two double-sided double-density (DSDD) floppy disk drives or one DSDD floppy disk drive and a hard disk. You also need at least 128K of RAM, and DOS 1.1 or a later version.

MANAGER, Version 4.0
Manager Software
1961 Middlefield Way
Mountainview, CA 94043
(800) 227-6621
(415) 964-5333
List Price: $195
Description: Relational
Requires: DOS 1.1, 128K RAM, two disk drives.
Records per File: 32,767

CIRCLE 746 ON READER SERVICE CARD

Each data file can have up to 32,767 records. Records can have up to 50 fields (columns) of up to 255 characters each, as long as the total record length does not exceed 2,048 characters. *MANAGER* can sort on all 50 fields.

Modes of Operation

MANAGER offers three ways to use its powerful commands: a menu system, command line entry, and procedures. The menu-driven prompting system is available for the first-time or inexperienced user. The menus lead you through all the commands and options available in the program. Even when the system prompts you for a file name, the available files for use are shown in a menu for easy selection. All the system parameters (printer specifications, color or monochrome display, data drive selection, and so on) are set up with the menu system.

Experienced users may opt to use a second mode of operation: entering the commands directly using a command line. You need only turn the menus off, and the *MANAGER* command prompt (*:) appears for direct command entry. All the commands available with the menu system are also active in the command line system. The advantage of this method is that it is much faster to choose and run commands directly than to use the menu system. *MANAGER* has an on-line help system that shows you the possible commands and their respective formats in case you forget. All the commands can be referenced by their full name or the first three letters—for example, the APPEND command can also be expressed as APP.

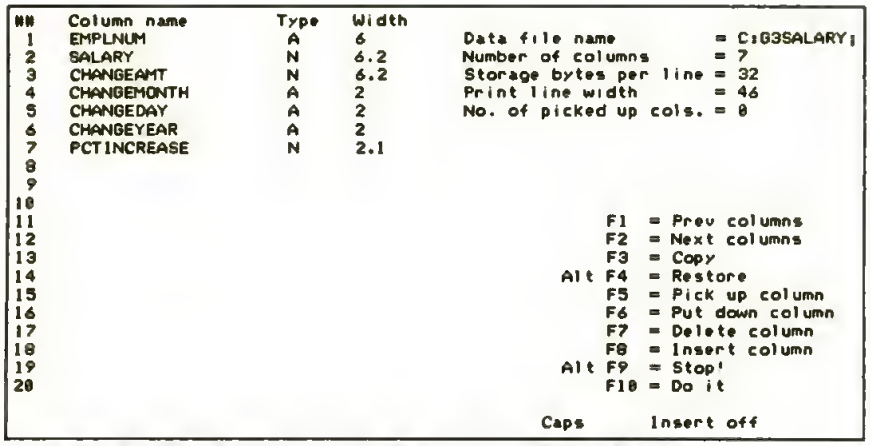
The third method of operation is to use "procedures." Procedures are groups of *MANAGER* commands together in one file. This file, classified as a text file, is run just like a batch file is run in DOS. You can create text procedures using the TEXT editor, part of *MANAGER*, or by "logging," or copying, all your selections from the menu system into a file.

The procedure method opens all sorts of opportunities. *MANAGER*'s procedural language has system and user variables, input commands from the keyboard or files, subroutines, GOTOs, and the like. There are also some special system functions that can be accessed for time, date,

change in dates, file size, field lengths, and other file and system parameters. Any of the commands that can be used from the menu system or command line can be used in a procedure.

Data Entry and Modification

There are many different commands that allow you to add, edit, or delete data



The *MANAGER* data structures for the file reporting salary increases.

from data files. The first step in working with a database is to specify the fields that will appear in each record and the data types (alphanumeric or numeric) using the CREATE or STRUCTURE commands. The next step is to GET, or select, the data file to be accessed. The CHANGE, INPUT, and MODIFY commands allow you to change or add additional data records.

MANAGER allows you to specify which fields in the data file you wish to change—only those fields are displayed on the screen. You can select records to be erased using DELETE. When you are sure of your deletions, the COMPACT command erases the records selected using DELETE and renumbers the data file.

If you decide later to add or change a field, you can use the REFORMAT or RESTRUCTURE commands on the data file without first having to copy the data to a temporary file (unlike the MODIFY command in *dBASE II*). The REFORMAT and RESTRUCTURE commands leave the data alone unless you shorten the field width to the point that the data become truncated. RENAME allows you to change the name of a field within a data file. DESTROY will delete the entire file from the disk. The current data file field structure can be seen with the SEE command.

Another data entry command, FORM, allows the user to "paint" a Data Input Form sheet for later data entry and modification. "Painting" lets you specify where titles, headings, other text, and fields will appear on the screen. In this manner, you can create standard forms that might resemble actual business forms that your personnel use in the office. You can choose colors, center text, and locate different fields on the form anywhere you desire—consider yourself a database artist. Each form can be up to six pages in length.

The last method of entering data is to first create an empty database with the CREATE command and then exit *MANAGER* and use the supplied TRANSDB.EXE program. TRANSDB takes data from other sources and transforms them into *MANAGER*-readable data files. The program prompts you for the specific delimiters used in the file and then translates the information quickly. A file in Standard Data Format with 500 records (89 characters in length, 7 fields) was translated into a *MANAGER*-readable filename.DAT file in 45 seconds.

Data Manipulation

Once you have created a new database, either empty or with imported data, there are six basic commands that allow mass manipulation of data in that file or other files. The COPY command takes the data in the current file and copies it into another. APPEND takes a second file and attaches it to the end of the current file. You can merge the data from two different files into one of the two or into a third, "destination" file. You can sort a file on one or all of the file's fields and have the sorted information overwrite the current file or sent to a secondary file.

The final two commands provide the real power and flexibility of *MANAGER*. The LET command allows you to assign values to the different fields in a record, or groups of records, for many different conditions. The other command, CONSOLIDATE, merges the information from one file into the same file or a secondary file using one of the fields as a key. The value of this command is that conditional merges can take place. You can choose to select the first, last, largest, or smallest value in a field to keep in the new merged file. For instance, let's say that FILE2 has Employee Number and Salary as its two fields. The Salary field contains all the past salary figures that the employee has ever earned; thus there are many records with the same employee number but different salary figures. You could consolidate the employee number and present salary figure (assuming the last salary figure in FILE1 is the present one) into a secondary file called PRESENT by typing in:

```
CONSOLIDATE SALARY/O BY EMPLOYEENUMBER TO PRESENT;, NEW
```

MANAGER offers three ways to use its powerful commands: a menu system, command line entry, and procedures.

Data Reporting

Most users believe that the most important function of any database package is its

ability to create reports. In *MANAGER*, there are basically two steps in creating a report. The first is to perform any calculations and consolidations of data by using either the command line approach or using a procedure. After you have modified a file or created a new temporary file that contains the information you want, the PRINT command will create a standard report for the screen, printer, or a disk file. PRINT has many options to tailor the report to your liking. There are options for different form feeds, variable spacing between lines, subtotals, grand totals, grouping like data together, replacing repeated data with a character (space, quotation mark, apostrophe, or decimal point), and other format controls. As with other commands, PRINT can be invoked from the command line or by a procedure.

There is a second way to create a report. The Easy Report Writer (ERW), similar to a procedure, is dedicated to creating reports. It is used when more control over the report is desired than the PRINT command allows. The ERW has conditional commands and subroutine capability to provide for the many different types of report situations that might arise. The conditional commands, such as IF-THEN, only work with numbers at this time, but Call Manager says that string checking is planned for *MANAGER*. ERW is an interpretive-type program; that is, it has to re-evaluate each command every time it is executed. Since the re-evaluating process slows down the report writer, any computations or conditional data selection should be taken care of before using the ERW by using the LET, CONSOLIDATE, MERGE, and other data file commands, which can manipulate data very fast. A test procedure accessed six files (each file with a minimum of 500 records), performed three one-variable sorts, one two-variable sort, three LET assignments, two CONSOLIDATIONS, and destroyed two temporary files. It took only 7 minutes and 48 seconds on my PC with 320K RAM and a hard disk. (It took 15 minutes and 20 seconds when I used two floppy drives.)

Ease of Use

The three different modes of operation available with *MANAGER* can be learned in progressive fashion. The menu system is easy to get started on. The manual provides a very basic example that walks you through how to use the menu system. When you are finally comfortable with the commands, you can exit the menu system and enter commands with more efficiency and speed using the command line and by running procedures. Some of the more powerful commands, like PRINT and LET, can be burdensome to use with their many options, but that is intrinsic to their flexibility. Overall, *MANAGER* runs smoothly.

Many a good program has the manual to blame for its downfall. MANAGER's manual could use some polishing.

The Manual

Many a good program has the manual to blame for its downfall. *MANAGER*'s manual is not bad, but it could use some additional sections, some more explanation in places, and some polishing here and there. The main distraction was that Version 4.0 has various new commands and enhancements, and the descriptions of these new features came on 8½- × 11-inch sheets, while the manual is the IBM manual standard 5½- × 8-inch size. I had to switch back and forth from the large addendum sheets to the original manual. If the company does reissue the manual, it would also help if a nontechnical person would rewrite the documentation. The information you need is usually there, but some details have been taken for granted where some additional explanation and examples would have really helped. An error section explaining error messages, causes, and possible solutions and a more in-depth tutorial covering all the commands (instead of just some of them) would also have been helpful. The manual does an excellent job of using colors to differentiate between user input (white), system prompts (blue), warning messages (red), system output and references (green), and headers (yellow).

Strong and Weak Points

MANAGER provides a forms generation system (FORM) for inputting data but does not provide the same "paint" capability for reports. The ERW system that is provided is weak in certain areas—it runs slowly and does not allow string manipulations (even though the manual gives an example using strings). The manual, tutorial, and on-line help messages could also use some beefing up.

The good news is that the price for all that *MANAGER* has to offer is only $195, well below most database packages offering this much power and flexibility. The system works well with few bugs, most of which were in the ERW and FORM command, which are fairly new. Call Manager says that a new version of FORM will soon be available to get rid of the few bugs. It will have some additional enhancements and will correct the ERW problems with strings.

Call Manager also plans to introduce a graphics system and an enhancement to the TEXT editor that will make it a full word processor. The combination of *MANAGER*'s powerful database plus graphics and word processing should provide Call Manager with a solid package, especially if it keeps the price down. The company is also going to allow you to access up to 66 files when creating forms and building reports. I would keep my eye on this product; the future looks bright.

—George D. Hughes, Jr.

(continued)

Input Screen Specifications

Method	Capabilities				
	No. screens per file	No. files per screen	Simulate paper forms	Link help messages/ prompts to a field	Master/detail relationships
Fixed; field formatting possible only via report form development.	Limited by disk space.	Up to 13 files, including ancillary files, can be used in a single form.	Yes	Yes	Programmable
Can be automatic, "painted" or programmed according to circumstances.	Limited by disk space. Each form can be up to 6 screens.	1	Yes	Programmable	No
"Painted"	Limited by disk space.	1, but 32 files can be referenced.	Yes	Yes	Yes
Screen "painting" utility generates initial program source code. Programs you write can print the screen.	Limited by disk space.	16	Yes	Yes	Programmable
"Painted"/ Programmed	2 screens per Quick Gen or Report Gen application.	2 files per Quick Gen application, 3 files per Report Gen application.	Yes	Yes	Yes
Automatic/ Programmed	Limited by disk space.	Limited by disk space.	Yes	Programmable	Yes
Automatic in the standard QUERY/UPDATE model: "painted" in the *PRO-MATIC* programming environment.	9 data displays per program model	3 file structures per program model.	Yes	Yes	Programmable

Inverted Back

1. Follow instructions on the other side

Inverted Foldout slip-sheet

Folded edge of the page

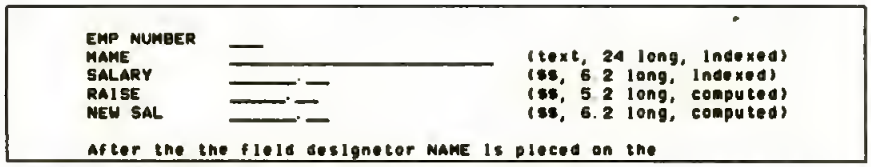
1. Open the foldout page
2. Insert this sheet with
    1. Front side touching the free page
    2. Arrow pointing to the fold
3. Slice the folded edge
4. Close the page and slip-sheet

Foldout slip-sheet

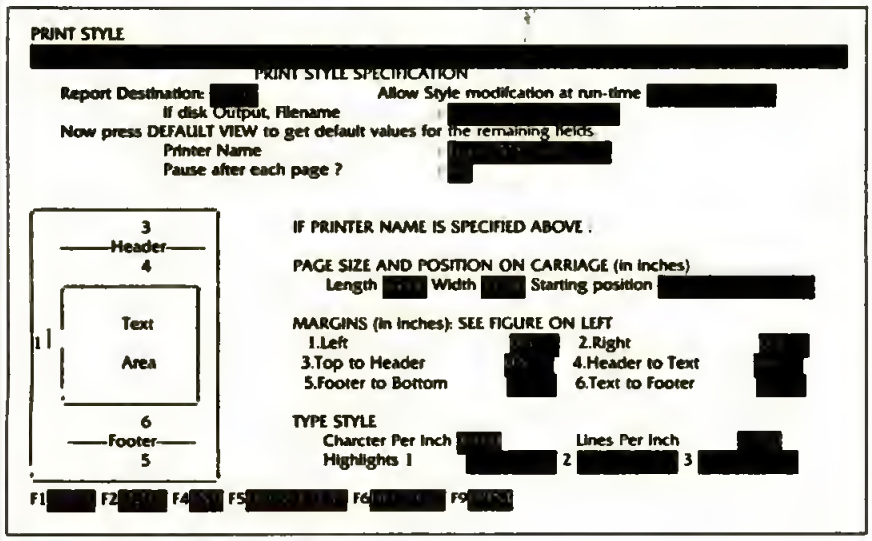
1. Open the foldout page
2. Insert this sheet with
    1. Front side touching the free page
    2. Arrow pointing to the fold
3. Slice the folded edge
4. Close the page and slip-sheet

Name	Data Model	Marketing Features		
		Length of Time on Market	Number of Sales	Price
FORMULA II Dynamic Microprocessor Associates, Inc. 545 Fifth Ave. #1103 New York, NY 10017 (212) 687-7115	Relational	Since October 1983	700	$695
MANAGER (Version 4.0) Manager Software 1961 Old Middlefield Way Mountainview, CA 94043 (800) 227-6621	Relational	Since spring 1983	1,000	$195
DATAEASE Software Solutions, Inc. 305 Bic Dr. Milford, CT 06460 (203) 877-9268	Relational	Since mid-1983	About 4,000	$600
THE SENSIBLE SOLUTION O'Hanlon Computer Systems 11058 Main St. #225 Bellevue, WA 98004 (206) 454-2261	Linked indexed files	Since January 1983 for the IBM PC	4,000	$695
probase probase Group, Inc. 2316 Artesia Blvd. Redondo Beach, CA 90278 (213) 374-7572	Relational	Since October 1983	About 2,000	$300 for *probase* only. $650 for *probase* plus the 3 generators.
METAFILE (Version 7.0) Sensor-Based Systems 1701 E. Lake Ave. Glenview, IL 60025 (800) 323-3731	Relational	Since June 1980	Over 5,000	$995
PRO-MATIC RG Software Systems P.O. Box 426 Fort Washington, PA 19034 (215) 576-0970	Relational	Since January 1984	Confidential	$595

DATAEASE: An Awkward Powerhouse



Defining the fields is the first step in designing a DATAEASE form. Fields can be designated as either indexed or computed, also called "derived."



***DATAEASE*'s Print Style Specification menu.**

When I began reviewing *DATAEASE*, I assumed that, as a Category 3 package, it would be powerful and easy to use. It does have a multitude of convenient features; you can, for example, enter commands and edit at the same time as you are defining or modifying forms, reports, or relationships. You can also easily add, alter, insert, or delete fields anywhere on the screen and import several data formats.

However, I found that *DATAEASE*'s strengths are counterbalanced by an awkwardness and rigidity that became increasingly noticeable as I used the package. Its most salient drawback is that it does not include a real procedural language but relies entirely on menus to perform the same tasks. You cannot bypass menus as you become more familiar with the package, and this awkwardness is intensified by the roundabout syntax you must use to define reports. These highs and lows make *DATAEASE* an uneven product.

DATAEASE
Software Solutions
305 Bic Dr.
Milford, CT 06460
(203) 877-9268
List Price: $600
Description: Relational
Requires: DOS 1.0, 192K RAM, two disk drives.
Records per File: 65,535

CIRCLE 739 ON READER SERVICE CARD

Creating the Form

In *DATAEASE*, the form you create to enter data is your file; you enter, edit, store, and view your data in the form. You must, therefore, begin your work by designing a form. *DATAEASE* makes this process simple; you "paint" a blank screen to create any format you like. When you use the data in a transaction, you retrieve it with the form name; you don't need filenames in *DATAEASE*. Of course, each form represents only one view of the data, but you can get multiple views of your data with the report features, which create any view by culling fields from more than one form.

Since these forms represent the only possible views, files that result from a report definition are not directly accessible because they are not output as forms. To be viewed, these files must be imported and a form created for them.

Because the form stores records, the record structure must be defined and the records entered into the form. To get started on a form, you move to the Forms menu and choose the Define A Form option. You then give the form a name and a blank screen appears. In this and other such menus you have full use of the cursor keys and the Ins and Del keys. You can move the cursor to the margins with Ctrl and cursor key combinations. The function keys are also used; their functions are displayed at the bottom of the screen. *DATAEASE*'s full use of the PC keyboard makes creating or editing a form easy.

Since you will enter data one record at a time, you can lay out the fields of a single record to facilitate data entry or editing. Typically, field names appear along the left margin followed by a line indicating the maximum length of the data for the field. For example, to designate a field as the Name field, you type it in, move the cursor out a few spaces, and press F10 to define that field. You are then prompted for a field name; pressing Enter allows the name to be accepted. A field type prompt appears next; here your choices are text, numeric string, number (integer, fixed point, or floating point), date, time, and dollar. The choices are displayed across the top of the screen. You are next prompted for the maximum length of

(Text continues following the Database Chart.)

Entry Editing Capabilities

None	Renge Tests	Specific Velues	Defeult Velues	Teble Lookup (To en Outside File)	Verify (Requires Data to Be Input Twice)
—	Yes	Yes	Yes	No	Programmable
—	Programmable	Programmable	Programmable	Programmable	Programmable
—	Yes	No	Yes	Yes	No
—	Programmable	Programmable	Programmable	Programmable	Programmable
—	Programmable	Programmable	Programmable	No	Programmable
—	Yes	Yes	Yes	Programmable	Programmable
—	Yes	Yes	Yes	No	Programmable

EDITOR S NOTE Dash (—) indicates 'Not Applicable'

Entry Editing Capabilities (cont'd)			Adaptation to PC		
Required Field	Date Tests/Date Conversion	Other	ASCII Characters Only	Graphics Symbols	Color
Programmable	Format is checked as date is entered. Can be set to DD/MM/YY or MM/DD/YY during installation.	No	Yes	No	No
Programmable	Programmable	No	Yes	No	Yes
No	No	Computed fields	Yes	No	No
Programmable	Yes	No	Yes	Boxes around data groups	No
Programmable	Format is checked as date is entered. Can be set to DD/MM/YY, MM/DD/YY or YY/MM/DD during installation.	No	Yes	No	No
Programmable	Yes	Translations, input and output pattern checking	Yes	Yes	Yes
Yes	Yes, dates can be used in all relevant math operations.	No	Yes	No	No

DOS 2.x Subdirectories	Alternate Input Methods (mouse, etc.)	Files Across Multiple Drives	Function Keys	User Interface	Files: Method of Data dictionary or other means
No	No	No	No	Menus/prompting	Fields created via definition procedure using FILEDEF program
No	No	Yes	Yes	Choice of menus, natural language command line, or procedure interface/ entry	Specify type, length, and decimal places if numeric
No	No	No	Yes	Prompting	No
No	No	No	No	Uses menus, will prompt for field labels	Data dictionary
No	No	No	Yes	Menus/prompting	Fields created via definition procedure in Quick Gen
No	No	Yes	Yes	Visual/verbal	Name, type, length, default value, ranges, translations, input and output patterns, comments
No	No	Yes	Yes	Uses prompting, reverse video, split screens and cursor positioning. Menus used widely in conjunction with visual presentation of data	Data dictionary

Files (cont'd)

Specification	Things You Can Specify				
Must files be built/modified only from data dictionary?	None	Field data	Tokens, aliases, or synonyms	Index data	Permissions/security
Yes, using FILEDEF program.	—	Alphanumeric, integer, long integer, and floating point.	No	Yes	Programmable
Files and data dictionary built simultaneously	—	Programmable	Programmable	Programmable	Programmable
—	—	Name, type, length.	No	Yes	Yes
Yes, but data files can also be imported/exported.	—	Name, length, type, upper case only, decimal positions.	Overlapping fields are supported.	Up to 9 keys per record.	Programmable
Restart file must be saved with data file to allow later modification.	—	Name, alphanumeric, date, floating-point numeric, integer numeric, fixed-point numeric.	No	INDEX program will index files by key field plus up to 3 subfields.	Passwords enabled via Menu Gen program generator.
Files and data dictionary built simultaneously.	—	Programmable	Yes	Yes, but not in data definition stage.	Programmable
Yes	—	Alphanumeric, dollars, percent, date.	No	Yes, via Sequence Control (up to 3 keys) and Dynamic Key Sort (11 "candidate" fields can be set up but only 3 can be used at run-time).	Programmable

Encryption	Relations	Validity tests	Error or prompting messages	Multiple views of database	System: Maximum No. Record Types per Database
No special feature, but FORMDEF forms are converted into run-time forms (compiled) before execution, making them unreadable by normal means.	Multiple file relations are possible; up to 6 standard files and 13 via programming.	Yes, will test entered data according to user-defined criteria.	Yes	Yes	6-file maximum is standard in reports, 13 files by user programming
Programmable	Programmable	Programmable	Programmable	Yes, with different forms or reports.	1; others can be linked with programming
No	Yes	Yes	Yes	Yes	Unlimited; 32 usable at one time
No	Programmable	Programmable	Programmable	No, but can index up to 9 ways.	Unlimited, but only 16 can be open simultaneously
No	Multiple file relations are possible.	Only data type is checked.	Error messages and help text	Yes, single files may be used in multiple applications	2-file maximum in Quick Gen, 3-file maximum in Report Gen Programming can overcome both limits.
Programmable	Programmable	Yes	Programmable	Yes, with different forms or reports.	1; others can be linked with programming
No	Programmable	Yes	Yes	Yes	Multiple, dependent on programming

Specifications					Error Handling
Maximum No. Fields per Record	Maximum Record Size	Maximum No. Records per File	Maximum No. Records per Database	Maximum Field Size	
100	1,024 bytes	999,999,999	Limited by disk space.	127 bytes	Field-by-field
50	2,048 bytes	32,767	32,767	255 bytes	Field-by-field on reporting and selective reprompting on data entry into forms and screens.
255	8,000 bytes	65,535	Limited by disk space.	255 bytes	Field-by-field
1,000	Limited by disk space.	16,777,216	16,777,216	255 bytes	Field-by-field is automatic, total and selective reprompting are programmable
64	1,024 bytes	65,536	Limited by disk space.	64 bytes	Field-by-field
250	1,000 bytes	32,000	32,000	235 bytes	Field-by-field and selective reprompting
99	2,048 bytes	32,767 per "database volume	3,200,000	80 bytes	Field-by-field

Data Types and Maximum Sizes

Character	Numeric				Date
	Integer	Floating point	Money or dollars	Other numeric	
127 bytes	±29,999	±99,999,999,999,999 (stored in BCD format)	No	Long integer, ± 999,999,999	Yes
255 bytes	15 digits	14 digits	No	Fixed point, 15 digits.	No
255 bytes	14 digits	14 digits	14 digits	Fixed point, 14 digits.	Yes
255 bytes	15 digits	No	No	Computations are done to 5-decimal-place precision, then rounded to the precision of the target field.	Yes
64 bytes	12 digits	12 digits	No	Fixed point, 12 digits.	Yes
235 bytes	20 digits	No	20 digits; can be specified using input/output pattern.	Fixed point, 20 digits.	Yes
80 bytes	14 digits	No	14 digits	Percent	Yes

Types and Sizes (cont'd)		Demo Version			Data Importing
Time	Logical	Available?	Cost	Limitations	
No	No	Under development	$10–$20	User will not be able to output any data.	ASCII only—not well documented
No	No	No	—	—	DIF, SDF or special formats using TRANSDB data translation feature.
Yes	Yes	No	—	—	DIF, *dBASE II*, comma-separated ASCII
No	No	To dealers only	$35	150-record limit	BASIC random format
No	No	Yes	Free	26-record limit	DIF, but import export method not documented
Yes, in reporting phase.	No	Yes	$25	25 records per file, 500 bytes per record, small text and sort areas.	Import facility said to be available, but did not work. Reviewer wrote conversion routine in BASIC.
No	No	Yes	Free	Just demonstrates features.	DIF

Data Exporting	Advanced Features				
	Back-up-ability/ Copy Protection	Audit Trails		Data Reatructuring	
		Pre/post imaging	Activity or transaction log	Technique (inherent/ separate program)	Adding or changing indexes
ASCII, can include embedded characters such as double quotes and commas.	Internal COPY function can back up files and remove records marked for deletion. The INDEX (R)ecovery option will do its best to repair damaged files.	No	Transaction files can be developed by the user to keep "snapshots" of how data are manipulated during a database session.	Inherent	Yes, multiple indexes can exist for a single file. Old indexes can be deleted and new indexes created at any time.
No	Not copy protected.	No	No	Inherent	Yes
DIF, comma-separated ASCII.	Full back-up capabilities.	No	No	Inherent	Yes
BASIC random format	Program won't work unless it displays the registered owner's name and address on the first screen, which discourages passing out free copies to friends.	No	No	Separate restructure utility	Yes, separate rekey utility.
DIF	Not copy protected.	No	No	Inherent	Yes
Export facility said to be available, but did not work.	Not copy protected.	No	No	Inherent	Yes
DIF	Not copy protected.	No	No	Automatic reorganization of database files whenever revisions occur.	Yes, sort keys can be added/deleted/cloned as required.

Features (cont'd)		Report Generation			
Linked or Multiple Update of Indexes and Files	High-level Language &/or Product Interface	Capabilities			
		Sorting	Aggregates (min., max., count, avg., percent, etc.)	Arithmetic (#, /, +, −)	Parameter passing
Yes, via batch update.	Yes	No, ISAM files used.	Aggregates can be created by applying math and/or logic functions to the contents of memory variables. Can also do date calculations and remove decimal places.	Yes	No
Yes	No	Yes, on all fields.	Subtotals, totals, and others with programming	Yes	No
Yes	No	Yes, on all fields.	Totals, subtotals, minimum, maximum, average, count.	Yes, in computed fields.	No
Programmable	No	Yes, but on 1 key only.	Programmable	Yes	No, but temporary files can be used.
Yes, via batch update.	Yes	No	Count, subtotal, total.	Yes	No
Programmable	No	No separate sort fields, can have concatenated sort key up to 235 characters long	Subtotals, totals, count, average, and others with programming.	Yes	Yes
No	No	Yes, 3 sort fields for fixed-key sorts; 11 sort fields for dynamic-key sorts	Total, average, minimum, maximum.	Yes	No

		Query Language			
Flexibility of output	Multifile access	Mass additions, deletions & updates	Load and unload	Execute stored scripts	Quality of output
Fairly good	Yes	No	Files can be loaded/unloaded via QUERY commands	Yes, query strings can be saved to disk for later use.	Good; includes mailmerge function.
Fairly good	Yes	Yes	Yes	Yes, via procedural language.	Good
Constrained by its way of naming computed fields.	Yes	Yes	Yes	Yes	Fair
Great	Yes	No	No	Yes, via procedural language.	Good
Adequate	Yes	Yes, via updates.	Yes, via macro programming commands	No	Good, but primary file record will be displayed only if there are matching secondary or secondary and tertiary records.
Good	Yes	Programmable	Yes	Yes, via procedural language.	Very good; *METAFILE*'s text processor allows flexibility in report formatting.
Good	Yes	Programmable	Programmable	No	Good

Report Generation (cont'd)					Procedural Language
Query (cont'd) Other	Report Formatter/ Generator	Screen Dumps	Other	Built-in Applications or Examples	
Index files can be created and saved via the query language.	Yes, part of the FORMDEF procedure.	Yes, via FILEPROC procedure or QUERY strings that use the PRINT command.	No	No	Yes, FORMDEF programming commands.
Query language capabilities are built into commands.	Yes	No	No	Yes	Yes
No	Yes	Yes	No	No	No
No	No	Yes	No	Mailing list sample	Yes
Concatenated fields and calculated fields.	Yes, via Report Gen, which creates executable report programs.	Yes, via Quick Gen applications or customized Report Gen programs	No	No	Yes, *probase* macros.
No	Yes	No	No	Yes	Yes
No	Yes, output available in reports, lists, and menus created via Program Models option	Yes	No	No	Yes, available via Program Models option.

Performance Measurements

Time to Enter Standard Info.	Time to Execute Standard Task	Time to Perform Sort	Time to Extract Random Records	Size of Database Created	
				Number of records in employee file	Space compression
22 mintues, imported.	17 minutes, 30 seconds.	No sorting; uses Indexed Sequential Access Method files.	2 minutes, 47 seconds to extract 4 records with last name=Williams.	500	No
1 minute, 20 seconds, imported.	15 minutes, 20 seconds.	2 minutes, 18 seconds.	2 seconds	500	No
Limited by typing speed.	6 minutes, 52 seconds.	5 minutes, 20 seconds. Had to use report writer.	1 second	500	No
1½ hours to prepare, 2 hours to import and index.	3 hours to prepare, 41 minutes, 40 seconds to list.	No sorting; uses indexes exclusively.	1 second	500	No
Limited by typing speed.	6 minutes	No sorting; uses Indexed Sequential Access Method files.	8 seconds to extract 2 records with last name=Williams.	25	No
1 minute, 54 seconds using BASIC conversion program.	3 hours, 8 minutes.	1 minute, 9 seconds.	4 seconds	500	No
20 minutes	18 minutes	9 minutes, 30 seconds.	3 minutes to list 2 records with last name=DiMeara.	500	No

Performance Measurements (cont'd)					Hardware/
Size (cont'd) Variable length of fields	Number & Size of Ancillary Files	Degradation with Additional Indexes	Time to Create a Standard Report to Screen	Tima to Executs a Standard Report to Screen	Minimum Configuration Required
No	Index, intermediate conversion and report form files	Minimal	5 minutes	17 minutes, 50 seconds.	128K, 2 drives, DOS 1.1.
No	2 temporary files, 21,788 and 24,508 bytes.	Degrades sort time by approximately 40 percent.	Less than 1 minute.	1 minute, 18 seconds.	128K, 2 drives, DOS 1.1.
No	Any number of index files. Size is a function of index field.	Minimal	6 minutes, 52 seconds.	18 minutes, 14 seconds.	192K, 2 drives, DOS 1.0.
No	3 index files: 27,648, 25,600, and 11,264 bytes	No	3 hours	41 minutes, 40 seconds.	128K, 2 drives, DOS 1.1.
No	6 ancillary files totaling 20K.	Minimal	10 minutes	6 minutes, 8 seconds.	128K, 2 drives, DOS 1.0.
No	3 files: 4,096, 8,192 and 8,192 bytes.	Degrades sort time by approximately 20 percent	About 1 minute	4 minutes, 4 seconds.	128K, 2 drives, DOS 1.1.
Yes	One 3K index file	Minimal	40 minutes	25 minutes	256K, 2 drives, DOS 2.0.

Software	Subjective Evaluations				
Configuration Used in Testing	Documentation	Program Robustness	Flexibility/ Ease of Use	Would You Buy This One?	Would You Accept It as a Gift?
320K, 2 drives, DOS 2.0.	Good-presentation of the less-complicated features, but tends to lose clarity when covering programming topics.	Could be better. A little too eager to hand the user back to the operating system.	Quite flexible, but quirky to use.	Probably not. Has some powerful features, but creating report form was too cumbersome.	No
2 drives, 320K, DOS 2.0; also 27MB hard disk, 320K, DOS 2.0.	Good	Good	Good	Yes, *MANAGER* offers many good features for little money.	Yes
512K, AST board with RAMdisk	Very good and clear. More examples would have been helpful.	Not very robust. it crashes easily	Easy to use because everything is done in response to prompts; difficult because sometimes language of prompts is not what you expect.	No, but some people would learn to use and love it.	No
256K, 2 drives, DOS 2.1.	Excellent	Excellent	Powerful, but procedural language is flawed.	Yes, for small business applications.	Yes
320K, 2 drives, DOS 2.0.	Covers many of the issues the beginner would be interested in learning, in a fairly easy-to-follow manner.	Adequate	Good	No, but is a good guide for a beginner and provides a lot of programming power.	Yes
320K, DOS 2 0 and 2 drives; also 27MB hard disk, 320K, DOS 2 0.	Fair	Good	Good	No, too expensive.	Yes
320K, 2 drives, DOS 2.0.	Quite good, even though written in textbook form.	Quite good	Good, but performance is slow on e floppy-disk-based system.	No	Maybe, it I were given an XT to run it on

(DATAEASE continued)

field. For the Name field, you can enter 24. You can further refine your field definitions by designating your fields as index keys, for range checking, or as derived.

The Name field would be a good candidate for indexing since you often need to select records based on this field. The range check is a nice *DATAEASE* feature that checks data entered against an upper and a lower limit, rejecting any that doesn't fit. A Derived field is a powerful way to perform a number of tasks; the data for this type of field can either be computed with some formula, looked up on another form, be a sequenced number or string of letters, or be a default constant number or string. For example, you could add a field called Raise and define it as a Derived field computed with a formula such as "SALARY" * 0.25.

Joins

One of the major tests of whether or not a database manager is relational is its ability to perform "joins," that is, to combine fields from two different files into a new file. *DATAEASE* can perform this task, which it refers to as Lookups. Looking up a field located in another form is a two-step process; you must specify how to look up the field under the Derived field option and then must define the relationship between the forms (files). The first part is easy; the syntax is `LOOKUP formname fieldname`. Relationships are defined on another menu. The Relationship menu asks you to identify the two forms involved and then to define fields from each form that are identical, such as Name or Employee Number. That's all there is to it. If you had another form, Employee Master Info, with your employees' Number, Name, Address, and Department on it, you could access those fields when entering data by deriving those fields with the LOOKUP command.

Data Entry and Update

Now, to enter some data on your form, you move to a new menu that both displays the forms already defined and prompts you to select one, because the data you enter will be identified with this form name. The screen then displays the blank form with field names and lines indicating the maximum length of the data. The cursor rests on the first field, Name. You then type someone's name, hit the Enter key, and the cursor moves to the next blank field. You type in Salary, hit Enter, and the Raise field is computed for you. The Address field, if you looked it up, would also appear. You then enter this record and move to the next one.

Range check is a nice DATAEASE feature that checks data entered against an upper and a lower limit, rejecting any that doesn't fit.

This same menu permits any record to be altered or updated. If a teacher, for example, had designed a student form with fields for the grades from five tests, the fields would only be filled in after the tests were corrected and graded. Then a computed field, Final Grade, could average the results to complete the process.

Query Language and Reports

DATAEASE combines a report writer, query language, and data manipulation language on one menu. The menu's options are to run a one-time-only report, a query, using a special print style for queries; define a new report; run an existing report; and then view, modify or delete an existing report. *DATAEASE* is designed to expedite the production of reports from the database. But while most systems permit simple queries to be ad hoc, with *DATAEASE* you must treat even a simple query like a big production, as if it were a full report—that is, you must define the print style, define the query, define the format, and then run it.

To give you the flavor of this procedure, I'll run through a report definition with the Salary Information Form. As usual, the menu displays numbered choices from which to select; you hit 3 to select the Define A New Report option and are immediately prompted to name it. (Let's call it Salary Info.) The system then asks, "Do you want to define a data-entry form for the report (y/n)?" This form would request various information to be included at run time. Instead, move on to define your query. You select the data to be included in the report, specify computations, prescribe Lookups, and organize the data. *DATAEASE* structures each part of this process by displaying the options available and prompting you to enter the number of the selected option. The structuring is rigid, but *DATAEASE* is somewhat forgiving of inadvertent mishaps. You can move into an Edit mode at any time to fix things, again with all the special PC keys functioning. But when moving in and out of the Edit mode, if you direct the cursor backwards to edit a field, *DATAEASE* may still be prompting you about the latest field you completed. This limitation quickly becomes frustrating.

For the Salary Info report, you are first prompted to select among the forms you have created, which are displayed by

number across the top of the screen. You select the Salary Info form. You are next prompted for criteria with which to select records from the form, which you do by comparing one or more of the fields to possible values for those fields, as in:

```
for formname with SALARY
>=30,000
and SEX = FEMALE.
```

The data entry form mentioned in the criteria statement can be included in this selection process by comparing one of the fields to data entered at run time. For example, if you requested Minimum Salary with the data entry form, you could use this comparison:

```
with SALARY >= data entry
Minimum Salary.
```

Computed Field Problems

Once you have completed record selection, you define the fields to be included in the report; the fields are normally selected from the form. This is where I had an unpleasant surprise. I found that the Derived fields on the Salary Info form are blank on the report! The Derived fields, which get their data by looking them up on another form or by computing them, are not used by the report generator. Bad news! You must redefine these fields to use them in the report. Unfortunately, the report definition procedure is much more awkward than the straightforward one for forms definition. For example, to redefine the computed field Raise for the report form, you start by typing in the Salary field. (Raise was defined in the input form as 25 percent of salary.) You next get the prompt "Select arithmetic symbol," with a list of numbered options. For Raise, you choose option 1, an asterisk, and then type 0.25, a ridiculously complicated procedure. You are then prompted for any statistical summary information you want to include.

> Most systems permit simple queries to be ad hoc; with DATAEASE you must treat even a simple query as if it were a full report.

DATAEASE provides some simple statistical functions such as sum, count, maximum, minimum, and average; thus a sum of the raises could be reported by the additional command ITEM SUM (selected from the given menu, of course). Finally, you are prompted to supply appropriate punctuation, indicating whether or not the current field is the last field in the report. I resented having to go to the trouble of choosing a menu number simply to insert a semicolon or a period.

I have a further criticism of *DATAEASE*'s handling of computed fields. In most other database managers, computed fields can be used as variables in other computed fields. For example, the Raise field, which I defined as 25 percent of the Salary field, could be used to define the New Salary field as SALARY + RAISE. Unfortunately, *DATAEASE* will not permit this, so New Salary would have to be defined as SALARY + (SALARY * 0.25). This limitation could be cumbersome in such important applications as calculating payroll, in which all sorts of deductions must be made.

How Slow Does It Go?

Floppy disks are just too slow for serious database management. It took over 2 hours to import to *DATAEASE* the data for the tests. With a hard disk, the process was about ten times faster. A RAMdisk was faster still. Joins really slow the processing of records, but joins are what relational database managers are all about.

Creating an employee history report brought home to me the inherent awkwardness of *DATAEASE*'s data manipulation language. There was really no way to compare the contents of two records or to calculate the difference between two records that have the same employee number. *DATAEASE* requires unique index keys for each record.

> In an attempt to make DATAEASE simple for a new user, Software Solutions has made its processes too rigid for my taste.

DATAEASE has utilities that can import data into a form from other software packages, transfer data between forms, and move forms or reports to other database packages. On other menus are procedures for backing up the databases and recovering from crashes. A Database Status report is a kind of data dictionary, listing all the forms, indexes, reports, and so on in the database.

Conclusions

In an attempt to make *DATAEASE* simple for a new user, Software Solutions has made its processes too rigid for my taste. It can do everything that a database manager is supposed to do, but I do not like the way it performs these tasks.

I did not find *DATAEASE* a hospitable environment in which to work. The syntax is confusing and the data manipulation process rigid. Although I worked with *DATAEASE* for a full 2 weeks, I didn't feel confident with its procedures. I was never certain what to expect as output. Even considering its several strong points, on balance *DATAEASE* suffers by comparison with similarly priced systems.

—James Perotti

PROJECT DATA BASE

THE SENSIBLE SOLUTION: A Tower of Strength

```
                DINOSAUR DONUTS, Inc. --- Personnel System

          EMPLOYEE RECORDS
-------------------------------------------------------------------------------
LAST NAME: Hanootte          FIRST NAME: Dean              EMPLOYEE NUMBER: 138138
ADDRESS  : 318 East 6th Street, Suite 200
CITY     : New York                STATE: NY ZIP: 10003


          DEPARTMENT RECORDS
-------------------------------------------------------------------------------
DATE: 840101    DEPT. NO.: 200    COST CENTER: 10000    EMPLOYEE NUMBER: 138138
DEPARTMENT NAME: Data Processing


          SALARY RECORDS
-------------------------------------------------------------------------------
DATE: 840101 SALARY: 42500.00                          EMPLOYEE NUMBER: 138138


      Next  Previous  Save record  Remove record  Clear fields  Jump screen
      Quit screen  Trace  ?(Help)
```

THE SENSIBLE SOLUTION screen showing data from each of the three files.

THE *SENSIBLE SOLUTION* is one of those packages that tries to be all things to all people and very nearly succeeds. Although not especially sophisticated in all areas, it still gives you more for your money than most database managers. For small businesses, the *SENSIBLE SOLUTION* may be the all-purpose program of choice.

In *THE SENSIBLE SOLUTION*, you create an application with three simple steps: (1) define the files you'll use, and the fields within them; (2) define the layouts of the screens and/or reports you want; (3) write a program in *THE SENSIBLE SOLUTION* language to process the data.

The process is simpler than it sounds. *THE SENSIBLE SOLUTION* helps you at each step of the way by filling the screen with useful information, prompting for what it needs next, and making available a consistent array of pull-down and pop-up menus that remind you of all the choices available.

THE SENSIBLE SOLUTION
O'Hanlon Computer Systems
11058 Main St., #225
Bellevue, WA 98004
(206) 454-2261
List Price: $695
Description: Linked indexed files.
Requires: 128K RAM, two disk drives, DOS 1.1.
Records Per File: 16,777,216

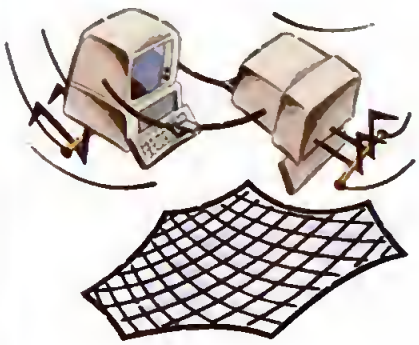
CIRCLE 738 ON READER SERVICE CARD

A Sample Personnel System

To evaluate *THE SENSIBLE SOLUTION*, I set up a *PC* test application with a small number of functions. It included a personnel file with one record per employee, a historical department file that recorded employee transfers, and a historical salary file that recorded raises.

As I discovered when I began to work, *THE SENSIBLE SOLUTION* disks won't, at first, handle more than 150 records. This temporary limitation is part of a clever program protection scheme. To "unlock" the full capacity of the system, you must call up O'Hanlon Computer Systems and agree on how your name and address should appear on the first screen whenever you use the system. You key it in. You are then given a password, which you also key in. You need only enter this information once. The name and address go with only one password, but you'll never guess the algorithm, so you can't patch the program to change what's going to appear on the first screen without going back to the 150-record limitation. The bottom line is that you can give *THE SENSIBLE SOLUTION* to your friends, but only if you're willing to have your name and address appear on the copies they give to their friends.

After unlocking the system, you can get down to business. The first decision you'll need to make when designing files in *THE SENSIBLE SOLUTION* is which fields will be used to make searches. You can have up to nine such key fields per file, and when you tell *THE SENSIBLE SOLUTION* to save a record, it updates all associated indexes. Furthermore, all keys in a record can be changed before storing a record back on disk. *THE SENSIBLE SOLUTION* will delete the old keys and insert the new without making you think twice about it.



One of the few facilities that *THE SENSIBLE SOLUTION* lacks is the ability to sort extracted data prior to printing a report. This limitation means that any sequence in which you'll ever need to see your data must be defined from the start as a key field.

You may find this lack of a SORT utility particularly irksome if you expect to see your data arranged in complementary ways (for example, by last name within

What's the best recommendation you can make when you're asked about business graphics?

The New Business Professional Plotter from Hewlett-Packard— The 6-Pen HP 7475A

Today, business professionals are becoming more aware of the vital importance of business graphics to their success. Tomorrow, they may be asking for your recommendation. Here's some important information that will help you. Tell them...

Make a first impression that lasts

Truly impressive graphic presentations can create a first impression of quality and professionalism that lasts and lasts. The way you present your information can be equally as important as the information you're presenting. And that's where the new HP 7475A Business Professional Plotter lets your professionalism shine through.

Standards unsurpassed in the plotter business

The technical standards of the HP 7475A have no equal for producing quality graphics. With a resolution of one-thousandth-of-an-inch, curved lines are smooth, not jagged, and straight lines are *consistently* straight. Its exceptional repeatability (the ability of a pen to return *precisely* to a given point), assures that intersecting lines and circular shapes will meet *exactly.*

Compatible with almost any personal computer in your office and supported on today's most popular graphics software packages

The HP 7475A quickly "makes friends" with most of the personal computers you may already have in your office, including IBM®, Apple™, Compaq™, Osborne®, and Commodore™—as well as a host of HP computers. You even have a choice of many off-the-shelf software packages that give you "first-day" productivity with the HP 7475A.

Your Choice: 2 media sizes

While most professional business applications will be satisfied with standard 8½ x 11" paper or transparencies, the HP 7475A adds the capability of plotting on larger 11 x 17" media, too.

The cost? Surprisingly affordable

The new HP 7475A Business Professional Plotter is an amazingly affordable $1895. When you consider the high cost of having your graphics prepared by an outside service, you'll find the return on your investment is almost immediate.

Another choice: HP's low-cost, high performance Personal Computer Plotter

For the "business on a budget," you may also want a look at our 2-pen Personal Computer Plotter, the HP 7470A. Its low-cost (only $1095) is as remarkable as the quality of its plots. With many of the same features as the new HP 7475A, the HP 7470A plots on media up to 8½ x 11." It stores and caps two-pens, and you can easily change the pens for multi-color plotting.

Send for your FREE "Better Presentations Package" today!

For a FREE sample plot, overhead transparency, and more details, mail the coupon below. We'll also enclose a list of software packages you can use right "off-the-shelf."

For the name of your nearest Hewlett-Packard dealer call toll-free 800-FOR-HPPC.

1101304

HEWLETT PACKARD

YES! I want to make the most informed business graphics recommendation I can. Please send me your FREE "Better Presentation Package," so I can learn more about the new HP 7475A Business Professional Plotter and the HP 7470A Personal Computer Plotter. I understand I will receive this valuable package without cost or obligation.

Name _____ Title _____

Company _____

Address _____

City, State & Zip _____

Phone Number ( ) _____

My computer is _____

Send to: Hewlett-Packard, 16399 W. Bernardo Drive,
San Diego, CA 92127
Attn: Marketing Communications

11304 PM8

CIRCLE 140 ON READER SERVICE CARD

HARD DISK + With A Single Slot.

Unleash your IBM-PC/XT with IDT's hard disks and SCSI technology.

Innovative Data Technology is bringing unprecedented power and virtually unlimited expansion to IBM-PC/XT users. Our new SCSI (Small Computer Systems Interface) hard disk subsystems put massive storage capacity at your fingertips—from 11 to 126 MB in a single external drive. With the capacity of configuring up to 14 drives through the SCSI bus, that puts nearly two billion bytes of on-line storage at your disposal.

Single slot expansion

Unlike most PC add-ons, IDT's SCSI hard disk subsystems and other peripherals are connected through a single SCSI host adapter on your PC—no additional expansion slots or cards are necessary—future disks and other peripherals and additional PC hosts are simply daisy-chained into the SCSI bus.

Multi-user capability

IDT built the SCSI hard disk subsystem with multiple users in mind. One, two, or more IBM-PCs can access disk drives and other peripherals through the SCSI bus, allowing you to build a sophisticated system tailored exactly to your requirements.

The options are yours

With IDT's SCSI host adapter board, future expansion becomes a snap. Additional peripherals, including an extensive line of 1/2-inch IBM-compatible magnetic tape transports, are available for immediate shipment from IDT. You simply don't have to wait or worry about equipment compatibility with IDT components. Watch for 1984 announcements of streaming cartridge drives, printers, etc.

Tomorrow's solution today

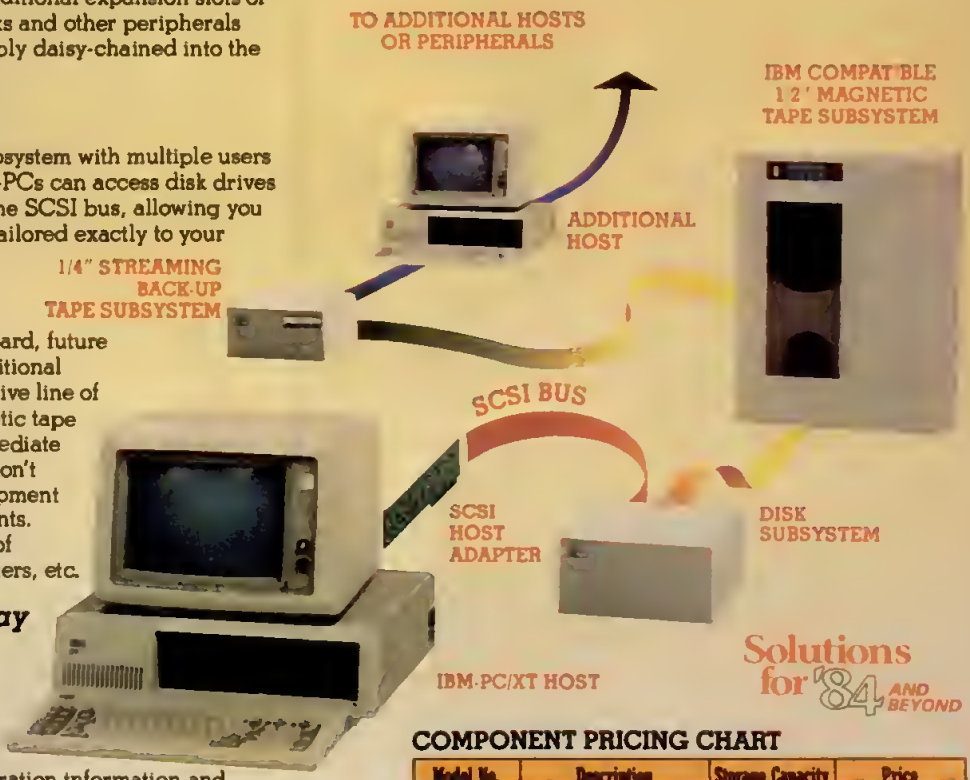
IDT's SCSI host adapter and SCSI hard disk subsystems will answer your data storage and system design requirements today. Contact IDT for complete system configuration information and details on other products.

Successful and easy installation assured

Supplied with each component are the required cables, complete software driver package and user language instructions. The user manual will have you quickly running and appreciating the many features of the subsystems, such as quick automatic boot load of the operating system from the IDT disk subsystem.

Satisfaction guaranteed

If not satisfied, the subsystems may be returned on approval from IDT within a 10-day period. All subsystems and components carry a six-month return-to-factory warranty on parts and labor.



Solutions for '84 AND BEYOND

COMPONENT PRICING CHART

Model No.	Description	Storage Capacity	Price
RD 2011M	Master Disk Subsystem	11MB	$2000.00
RD 2023M	Master Disk Subsystem	23MB	2550.00
RD 2035M	Master Disk Subsystem	35MB	2950.00
RD 2047M	Master Disk Subsystem	47MB	3150.00
RD 2126M	Master Disk Subsystem	126MB	6840.00
RD 2011S	Slave Disk Drive	11MB	1560.00
RD 2023S	Slave Disk Drive	23MB	2130.00
RD 2035S	Slave Disk Drive	35MB	2530.00
RD 2047S	Slave Disk Drive	47MB	2730.00
RD 2126S	Slave Disk Drive	126MB	6290.00
RD 8111H/A	IBM-PC/XT Host Adaptor		510.00
IDT 1/2" Magnetic Tape Subsystems			Consult Factory
IDT 1/4" Streaming Back-up Tape Subsystems			Consult Factory

Ordering Example: If your need is a 23MB Subsystem, your order would consist of the following components: **1-RD 2023M** @ $2550.00 + **1-RD 8111H/A** @ $510.00 + **Shipping & Handling** @ $12.00 = A **Total Order** of $3072.00 + tax (if applicable)

How to order:

Using the chart to your right, you may order IDT hard disk subsystems and SCSI host adapters by calling:

1-800-522-1500 Ext. 717

FOR IMMEDIATE ORDERS ONLY

Prices and availability subject to change without notice. No CODs. Send cashier's check or money order. All other checks will delay shipping three weeks. MasterCard and Visa accepted (include telephone number). Add $12.00 for handling and shipping UPS ground within the continental U.S. California residents add 6%. Approval needed on all returns. 0–10% restocking charge on all returned merchandise.

For additional product or technical information please call or write:

INNOVATIVE DATA TECHNOLOGY

ON THE RIGHT TRACK

P.O. Box 178160 • 4060 Morena Blvd. • San Diego, CA 92117

(619) 270-3990 • TWX: (910) 335-1610

CIRCLE 110 ON READER SERVICE CARD

IBM ® a trademark of International Business Machines Corp.

city for one report, and by city within last name for another). Since *THE SENSIBLE SOLUTION* requires key fields to be continuous while allowing them to overlap one another, you might have to duplicate the shorter of the two fields, say CITY, and define part of your record as

```
CITY.1
LAST.NAME
CITY.2
```

You would define the first two fields as one key, and the second two as another.

In the *PC* test application, the employee file was indexed by last name and separately by employee number. The department file was indexed by employee number concatenated with transfer date. Since there would probably be only a few records for each employee, I decided it was acceptable to index generically into the department file using the employee number with a zero date, and scan sequentially to find the most recent transfer. Similarly, the salary file was indexed by employee number concatenated with date of salary change.

Another price of not having a SORT utility is that you may have to replicate fields that logically belong in separate files to maintain indexes in the appropriate order. You may keep your department file in department order and your employee file in employee number order, but if you ever expect to see a list of employees by department, you'll just have to keep the department number in each employee record as well as the employee number in the department record.

The first step is to define the files and the fields in the Data Dictionary Maintenance program. All field names begin with an abbreviation of the file to which they belong. This abbreviation is necessary because field names must be unique across all applications in *THE SENSIBLE SOLUTION*. The second component of the name is the number of the field within the record. *THE SENSIBLE SOLUTION* asks you the length of each field but not where it begins in the record. Most dictionaries would assume that each field begins where the previous one left off, but not *THE SENSIBLE SOLUTION*. It requires that fields reside in the record in alphabetical order by name. This means that if you want to control the order of your fields, you must do so by coding the field sequence as part of the field name.

Next, I had to initialize the files. In this process, the program calculates (or recalculates) all of the offsets in the dictionary for the file in question and writes out a zero-length data file (with extension .MS) and a structured but empty index file (extension .KS). Since I was introducing data from outside *THE SENSIBLE SOLUTION*, I deleted the .MS files and got ready to rename my test files.

> To get THE SENSIBLE SOLUTION to take my files, I wrote a short BASIC program.

At this point I had to deal with the fact that some of the files distributed as part of the *PC* test were not laid out exactly as I had defined in the dictionary, that is, with the separate pieces of the key fields (the employee number and date) concatenated. It is possible to restructure databases using *THE SENSIBLE SOLUTION*, but only by generating the indexes twice. I decided to use a homier restructuring program instead—a text editor (KEDIT in this instance) that simply moved columns of data around to my liking. *THE SENSIBLE SOLUTION* never knew the difference.

To get *THE SENSIBLE SOLUTION* to take possession of my files, I then had to write a short BASIC program. *THE SENSIBLE SOLUTION* asks that files be in BASIC random format (fixed-length records with no CR/LF separators) and that the record length be a multiple of 128. This second requirement is a great space waster for files with small records, but it makes record locking in multiple-user systems simpler.

The only step left was to create the index files. *THE SENSIBLE SOLUTION* not only allows you to completely restructure data files and re-create the associated index files, but also to create the index files from scratch using a utility called REKEY. It is a slow process.

It was then time to develop an application using *THE SENSIBLE SOLUTION*. The first assignment was to scan the salary history file and calculate the amount and percent of salary changes. To keep things simple, these figures would be written into empty fields in the file. Although such a program doesn't really require a screen, I thought it would be nice to display the current employee number to convince myself that the program was actually accomplishing something. *THE SENSIBLE SOLUTION* Screen Painting program does exactly what its name suggests. You fill in a sample screen with whatever constants you like (company name headings, field names, comment lines), and then say where each field will be displayed. The program doesn't merely create screens and report formats, however. It also sees to it that a complete set of routines to manage these displays will be available to your program. The displays become a real-time window into your application. When your program changes a field that you have painted on the display, the rest of the screen reflects the change instantly. When you read a record, all of its fields named to the Screen Painter are projected on the screen. Also, if you hit the Esc key while a program is executing, it brings up a menu that allows you to navigate the displayed file in either direction, to delete the displayed record, to add a new record, or to blank out the fields in the screen so that new data can be entered.

After defining the screen, you can invoke the Program Generator, which will

Corporate and Institutional Accounts Welcome

Disk Drives

MAYNARD HARD DISK

- **10 MEGABYTE** HARD DRIVE w/SANDSTAR MULTIFUNCTION CARD (WS1) ... $995
- **10 MEGABYTE** HARD DRIVE w/SANDSTAR FLOPPY DRIVE CONTROLLER CARD (WS2) ... $1159
- **10 MEGABYTE** HARD DRIVE s/SANDSTAR MEMORY CARD w/o MEM (WS3) ... $1159

TEAC Drives

- **FD 55B** 5¼" Double Sided 40 TRK, 48 TPI $189

Control Data Drives

- **CDC 9428** Half Height, Double Sided 40 TRK, 48 TPI $189
- **CDC 9409** 5¼" Double Sided 40 TRK, 48 TPI $219

Tandon Drives

- **TM 100-2** 5¼" Double Sided 40 TRK, 48 TPI $209

Shugart Drives

- **SA 455** Half Height, Double Sided 40 TRK, 48 TPI $189

Monitors

Princeton Monitors:

HX 12 RGB (690 X 240) ... $489
SR 12 RGB (690 X 480) ... $Call
MAX 12 Amber Monochrome Monitor $195

Amdek:

310 A ... $175
300 A ... $169
300 G ... $159

Boards

AST:

Six Pak Plus w/64K Clock Calendar Parallel & Serial Ports (Options Available Game Port Upgradeable to 384K Bytes) ... $259

Memory 64K (Set of 9 Chips) ... $55

Mega Plus II w/64K Clock Calendar, & Serial Port (Options Available Parallel Game or Second Serial Port $269

Hercules:

Graphic Card W/Parallel Port $359

Koala:

Touch Table With Software $99

Paradise Systems:

Multidisplay Card (Both Color & Monochrome) $399

Persyst

Monochrome W/Parallel Port $239

Quadram:

Quad Color I $209
Quad Color II (Add On) $229

New Expanded Quad Board W/64K Expandable to 384K, With Parallel, Serial, Game Port, Clock Calendar 110 Bracket And Quadmaster II Software ... $269

Keytronics KB5151 Keyboard $239

Sigma:

Disc Drive Controller $179

Printers

Epson:

RX 80 (100 CPS, PAR-10") $Call
RX 80FT (100 CPS, PAR-10") $Call
FX 80 (160 CPS, PAR-10") $Call
RX 100 (100 CPS, PAR-15") $Call
FX 100 (160 CPS, PAR-15") $Call
LQ–1500 (w/parallel interface) (200 CPS, 67 LQ) $Call

Star-Micronics:

Gemini-10X (120 CPS, PAR-10") $Call

Juki:

6100 (18 CPS, PAR-15") $479

Texas Instruments:

TI855 W/Tractor Feed $895

Okidata:

ML92 (160 CPS, PAR-10") $479
ML93 (160 CPS, PAR-15") $679
ML84P (200 CPS, PAR-15") $829

NEC:

3550 (33 CPS, PAR-16") ... $1689
2050 (20 CPS, PAR-16") ... $889

Mannesmann Tally:

Spirit 80 (80 CPS, PAR-10") $359
160L (160 CPS, SER & PAR-15" $629

Modems

Hayes 300 Baud ... $209
Hayes 1200 Baud ... $489
Hayes 1200 B Board ... $439
Novation Smartcat 103/212 ... $399

TERMS AVAILABLE FOR CORPORATE AND INSTITUTIONAL ACCOUNTS

How To Order: Order by calling CompuAdd toll free on 1-800-531-5475 (if outside of Texas) or 1-512-250-1489 (if in Texas). You can also order by mail. Orders may be charged to a MasterCard or Visa account at no extra charge, or paid by Cashier's Check or Money Order. We do accept personal checks. Allow 10 days for check processing. We pay shipping and handling on orders delivered in Continental U.S.A. add 5% sales tax if Texas resident. All equipment carries a warranty.

CompuAdd Corp.

ORDER TOLL FREE:
(800) 531-5475 (If Outside of Texas)
(512) 250-1489 (In Texas)

This is THE PASCAL COMPILER You've Been Hearing About

VERSION 2.0

"It's almost certainly better than IBM's Pascal for the PC... Recommended."
Jerry Pournelle
Byte, May 1984

$49.95

"If you don't have CP/M [for your Apple], Turbo Pascal is reason enough to buy it."
Cary Hara
Softalk Apple, May 1984

"If you have the slightest interest in Pascal . . . buy it."
Bruce Webster, *Softalk IBM*, March, 1984

And Now It's Even Better Than You've Heard!

- **Windowing (IBM PC, XT, jr. or true compatibles)**
- **Color, Sound and Graphics Support (IBM PC, XT, jr. or true compatibles)**
- **Optional 8087 Support *(available at an additional charge)***
- **Automatic Overlays**
- **A Full-Screen Editor that's even better than ever**
- **Full Heap Management—via dispose procedure**

- **Full Support of Operating System Facilities**
- **No license fees.** You can sell the programs you write with Turbo Pascal without extra cost.

Yes. We still include Microcalc . . . the sample spreadsheet written with Turbo Pascal. You can study the source code to learn how a spreadsheet is written . . . it's right on the disk.* And, if you're running Turbo Pascal with the 8087 option, you'll never have seen a spreadsheet calculate this fast before!

**Except Commodore 64 CP/M.*

Order Your Copy of TURBO PASCAL® VERSION 2.0 Today

For VISA and MasterCard orders call toll free: **1-800-227-2400 x968**
In California: **1-800-772-2666 x968**
(lines open 24 hrs, 7 days a week)
Dealer & Distributor Inquiries Welcome 408-438-8400

Choose One (please add $5.00 for shipping and handling for U.S. orders. Shipped UPS)

____ Turbo Pascal 2.0 $49.95 + $5.00
____ Turbo Pascal with 8087 support $89.95 + $5.00
____ Update (1.0 to 2.0) Must be accompanied by the original master $29.95 + $5.00
____ Update (1.0 to 8087) Must be accompanied by the otiginal mastet $69.95 + $5.00

Check ____ Money Order ____
VISA ____ Master Card ____
Card #: _____
Exp. date: _____

BORLAND INTERNATIONAL
Borland International
4113 Scotts Valley Drive
Scotts Valley, California 95066
TELEX 172373

My system is: 8 bit ___ 16 bit ___
Operating System: CP/M 80 ___
CP/M 86 ___ MS DOS ___ PC DOS ___
Computer: _____
Disk Format: _____
Please be sure model number & format are correct.
Name: _____
Address: _____
City/State/Zip: _____
Telephone: _____

California residents add 6% sales tax. Outside U.S.A. add $15.00 (If outside of U.S A payment must be by bank draft payable in the U.S and in U.S dollars.) Sorry, no C.O.D. or Purchase Orders.

D7

get you off to a good start in writing your first *SENSIBLE SOLUTION* program. It prepares for you a simple program allowing data entry, file browsing, and record purging. You can then take this program and invoke the Source Code Editor.

This Editor is surely the most novel program of *THE SENSIBLE SOLUTION* set. Although you can insert, change, and delete lines as in any other editor, this one leads you through each step of the way. If you add a line, for instance, it prompts for a label. Then it prompts for a verb. You need only type the letter capitalized in each displayed verb name. If you type *i* for IF, it prompts you for the condition to be tested. You can type a number from 1 to 6 to indicate a choice of quantitative relations, the letter *d* for DUPLICATE KEY CHECK, or *r* for RECORD NOT ACTIVE CHECK. If you typed a number, it prompts you for the name of the field to be tested, the expression it is to be compared against, whether you want to use a GOTO or GOSUB statement, and what the target label for this statement is. Since you make most of these choices by pressing a single key, with the Source Code Editor, you find yourself generating page after page of syntactically pure code in minutes. After keying in the program, you then "compile" it.

When I finished scanning the salary history file and had calculated the salary changes, the next step was to produce a printed salary roster by department. Because of the way I laid out the files, I needed to sort the report by employee name within department. But *THE SENSIBLE SOLUTION* doesn't have an auxiliary SORT facility. Grrr. I settled for an alphabetical list by employee last name, showing most recent department and most recent salary. The logic consisted merely of reading through the entire employee file, and for each employee number scanning the related history files for the latest information.

The report I generated was designed using the SCREEN PAINTER utility, which actually works in two modes. In the first mode, you paint a screen exactly the way you want it to appear. In the second mode, you design individual lines for a report, each of which can be as long as your printer can handle. You write down the line numbers, because you'll need them later. For example, line 1 might be your company name, line 2 the report name, lines 3 through 5 field headers, and line 6 a detail line. When you get into the Source Program Editor, whenever you want to print one of these lines, you simply supply the line number as the operand of the PRINT command. Of course, you can print blank lines or lines defined within the program. But it helps somehow to keep the report design process separate. In general, you'll print detail lines repeatedly, and header lines at the beginning of the report and at page breaks. With a little programming effort, you can get totals and subtotals as well.

Functionally, THE SENSIBLE SOLUTION towers over much of the competition.

I should mention that although *THE SENSIBLE SOLUTION* has a powerful input editing mask facility, its output editing leaves something to be desired. You can't specify that commas should separate each group of three digits, for example, and instead of a floating dollar sign you'll find your dollar amount floating to the left.

Finally, I wrote the program to update all three files. Although the program UPDATE was written in about one-twentieth the time it would have taken using mainframe programming tools, it wasn't quite as simple as the first two jobs. For one thing, I had to manipulate records from three different files on the same screen. Also much more of the input/output function had to be explicit rather than implied.

The resulting program is not as foolproof as an update program should be. It allows the user to browse through three files independently and add, change, and delete records from all three at will—without checking the validity of the data in any way.

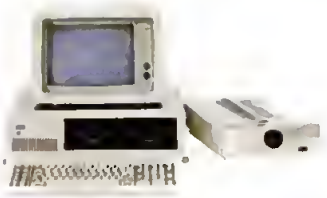
Summary

THE SENSIBLE SOLUTION is not a perfect package. On a floppy disk system it is slow and requires much swapping of disks. Screen painting is lugubrious, with a hypnotic large cursor fluttering through all points on the screen in a whimsical way. It needs a SORT utility. Its syntax for distinguishing data types is unusual: parentheses surround field names, angle brackets surround numeric constants, and square brackets surround character constants. Its support for arrays is hopelessly cryptic. It supports date fields but keeps them in an unusual format. You can transfer control to another program, but not return to the first. Perhaps most serious is its lack of support for temporary local variables.

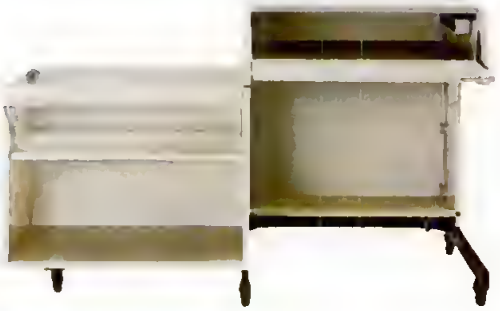
Functionally, however, *THE SENSIBLE SOLUTION* towers over much of the competition. Its documentation is uniformly excellent and doesn't even misuse the word *relational*. An included mailing list application helps speed the learning process. Nary a single bug crawls out of its shining armor. A package like this might even give you the excuse you've been looking for to buy a hard disk.

In addition to the $695 *THE SENSIBLE SOLUTION* language package, O'Hanlon Computer Systems also sells canned business applications for $400 to $750. These are available by themselves, but you'll also need at least *THE SENSIBLE SOLUTION* run-time package that sells for $200. O'Hanlon's upgrade policy is generous, and you can get lots of telephone help with a moderately priced service contract. —**Dean Hannotte**

One good idea



deserves another



and another

and another.

At IBM, we've been working to help your business keep up with its computer needs.

That's why we developed our innovative line of IBM Personal Computer Furniture. You'll find work stations, tables and chairs that are custom-designed to accommodate Personal Computers, as well as the people who use them.

And best of all, you'll find IBM's PC Furniture available in a variety of prices designed to accommodate your budget.

The IBM *Synergetix*® PC Work Station (pictured in pearl white) provides a convenient and compact workspace for the Personal Computer. In addition, it's completely mobile, so you can move it from office to office. But most important, the entire unit closes and locks, so you can secure and protect your system.

The IBM PC Table (pictured in walnut) is a stationary unit that's economically priced. It has the same durable construction as our PC Work Station, along with some basic security features. What's more, it's also perfect for the IBM PC*jr*

The IBM PC Chair boasts a price tag you don't have to sit down for. This ergonomically engineered seating comes equipped with fingertip adjustments and features a contoured backrest for greater comfort and support.

You'll find our IBM PC Furniture in a variety of attractive colors at your IBM Product Center. The IBM PC Work Station is also available at participating retailers. To find out the location nearest you or to order by phone, call *IBM Direct* toll free at 1 800 IBM-2468, ext. 522

IBM Personal Computer Furniture. It's designed with you and your PC in mind.

IBM®

CIRCLE 389 ON READER SERVICE CARD

Sensible Solution™ software from O'Hanlon separates the business tools from the toys!

Finally, a computer language you can understand, and accounting software applications you can really use in your business. The SENSIBLE SOLUTION™ is not just another "file handler", it is not a toy, it's a brand new computer language. With it, you can modify any of the ready-to-run accounting applications from O'Hanlon to better fit the personality of you and your business.

You see, everyone runs their business just a little bit different. That's why there is a SENSIBLE SOLUTION™ in the first place.

My wife Tova, is president of the TOVA 9 Corporation. Hundreds of people call TOVA 9 everyday to order her secret beauty formulas. The SENSIBLE SOLUTION™ can help Tova record and track those sales, control her inventory, and handle her payroll. SENSIBLE knows exactly who and where Tova's customers are and remembers what they like.

Even if you've never used a computer before, you can be programming with The SENSIBLE SOLUTION™ right away. It speaks in English, and you don't have to remember a long list of commands. The SENSIBLE SOLUTION™ isn't just user friendly, it's downright sociable!

Available at computer dealer stores near you!

CIRCLE 467 ON READER SERVICE CARD

THE SENSIBLE SOLUTION

O'HANLON
COMPUTER SYSTEMS
11058 Main Street, Suite 225, Bellevue, WA 98004
206/454-2261

probase: Exploring Under the Hood

```
EMPLOYEE NAME: Stefano      DiMeara
EMPLOYEE NUMBER:  194067
ADDRESS: 410 Market St  Shreveport  LA
  ZIP CODE: 71101

START DATE/DATE OF CHANGE    SALARY      PERCENT INCREASE   AMOUNT OF CHANGE

    /  /    Starting Pay    25800.00          0.00               .00


  10/18/82                  30005.40         16.30            4205.40
```

Part of a *probase* report showing amount and percentage of salary increase for Stephano DiMeara.

The *probase* database manager attempts to attract both the user who wants program generators to do all the work and the skilled programmer who wants the more creative environment of a custom programming language.

At its first level, *probase* features three automatic program generators capable of producing the code to create data input, update, retrieval, and reporting: Quick Gen, Report Gen, and Menu Gen. At the second level, *probase* provides the more sophisticated user with macro instructions and special instruction tables with which to develop customized database applications systems.

To create a database file with *probase*, you must first use the Quick Gen program generator. Many database development systems provide a wide range of menus from which to select options; *probase* initially displays only the prompt "Command?" at the top left-hand corner of the screen.

In response to this prompt you are expected to type in appropriate two-letter commands such as DD (disk directory), CS (clear system), and RC (return control to the operating system). When you enter commands, *probase* usually prompts you for further information or gives you a last chance to change your mind; for example, the command CS (clear system) invokes the prompt "Clear System Y/N?"

You invoke Quick Gen by entering QG at the Command? prompt. The Quick Gen logo appears on the screen, and you are asked if you want to begin developing a program by pressing B or if you want to see an explanation of the options available with Quick Gen.

If you press B, Quick Gen asks if you want to modify an existing application. You cannot always go back and modify a Quick Gen program, unlike a BASIC or Pascal program saved on disk. For every file created and saved you must also save a special "restart" file that contains information on the structure of the program file it is saved with. The restart file must be present when you attempt to modify an application. If you don't save a restart file the first time around, you can change a Quick Gen program only by learning *probase*'s macro language and metaphorically lifting the hood on an application to make changes.

Creating a File

When you create a new file, you must name it and indicate on which disk drive you want to save it. The program asks, Do You Want To Use Two Files In This Procedure? Automatically, you can link single files into two-file applications. Using the available programming facilities, you can go beyond the two-file limit if an application demands it.

To begin designing the entry form for a database, you must decide how many fields you will need for your application and what types of fields they will be. The more field types a system offers, the easier it is to create truly useful databases, because fewer constraints are placed on how the end product will look and perform. *probase* offers alphanumeric, integer numeric, fixed-point numeric, floating-point numeric and date fields.

After you have entered the relevant parameters, *probase* starts to look a little less cryptic. A main Quick Gen menu appears, and selecting option 1 allows you to create a screen format for the display of data. You paint the screen with field labels in the same way you type text into a word processing document, so you can easily mirror the format of a printed paper form you already use. If you need more than one screen for an application (if you have too many fields to fit on one screen, or if you just want to separate fields for ease of viewing), Quick Gen can handle up to two screens of labels and headings.

Before you can position fields on the screen next to the explanatory labels, you must return to the main menu by pressing the F1 key and entering the number 3 when prompted,

```
1=Position Labels 2=Modify
Labels 3=Main Menu
Enter 1-3[]
```

Through the main menu you create a screen display file that will eventually be

PROBASE
probase Group, Inc.
7316 Artesia Blvd.
Redondo Beach, CA 90278
(415) 638-1206
List Price: *probase*, $300; *probase* plus generator modules, $650.
Description: Relational
Requires: DOS 1.0, 128K RAM, two disk drives.
Records per File: 65, 536

CIRCLE 747 ON READER SERVICE CARD

Introducing AST-PCnet II.

Now PC networking is as easy as plugging-in your phone.

The advantages of Local Area Networks (LANs) are well known. Existing personal computers can be tied together to share information and expensive peripherals such as disks and printers.

Now AST makes networking easier and more economical than ever before. With AST-PCnet II, you simply insert the PCnet II board into an I/O slot in your IBM PC or XT. Then connect the PCnet II "twisted-pair" cable to the main network cable using a standard modular "telephone jack."

The same kind of jack that's used on your telephone. To move your PC from one point to another on the network, simply plug in at the desired location. It's that easy.

With AST-PCnet II, anywhere from 2 to 160 PCs can be interconnected. Standard PC-DOS commands are used to access remote drives and printers. And dedicated file and print servers are not required, because shared PCs also function as standard workstations.

We're AST, the world's leader in communications and enhancement products for the IBM PC. To find out how AST-PCnet II can expand your IBM PCs and XTs into a reliable, versatile LAN, call or write AST Research, 2121 Alton Avenue, Irvine, California 92714. (714) 863-1333. TWX: 753699ASTR UR

AST RESEARCH INC.

AST-PCnet II is a development of AST Research Inc. Software protocols are based on technology licensed from Orchid Technology Inc.

AST-PCnet II Local Area Network

CIRCLE 104 ON READER SERVICE CARD

AST brings you the perfect 4-5-6 for your Lotus™ 1-2-3.

Introducing the MonoGraphPlus™ Graphics Card.

Lotus 1-2-3™ is probably the most-used productivity software around. The trouble is, you can't display 1-2-3 graphs on your IBM monochrome display.

That's why AST developed MonoGraphPlus™ for the IBM PC and XT. It replaces IBM's monochrome card, permitting high-resolution bit-mapped graphics and text on the monochrome display.

But our MonoGraphPlus gives you much more. While Lotus offers three useful programs (1-2-3) in one software package, MonoGraphPlus gives you three additional hardware features (4-5-6) on a single card: a printer port, a serial port, and a real-time clock-calendar. Our comprehensive documentation will even show you how to get an extra two lines of text on your screen.

So now you can produce high-resolution, flicker-free graphics without giving up the high-quality text display that makes IBM's green monitor so popular. You can also expand your PC's memory with our MP series of memory cards, turning your PC into an even more powerful workstation capable of producing very large spreadsheets with instant charts and graphs.

Leave it to AST to offer yet another state-of-the-art enhancement product for the PC. You see, we're the world's leading supplier of enhancement products for the IBM PC, offering a complete family of multifunction cards, communications emulators, and local area network products.

To get the perfect 4-5-6 for your PC see your local computer retailer, or contact AST Research Inc., 2121 Alton Ave., Irvine, CA 92714. (714) 863-1333. TWX: 753699ASTR UR

AST RESEARCH INC.

IBM is a trademark of International Business Machines Corp.
Lotus and 1-2-3 are trademarks of Lotus Development
MonoGraphPlus is a trademark of AST Research, Inc.

MonoGraphPlus Graphics Card

CIRCLE 103 ON READER SERVICE CARD

saved to disk with the extension CRT. Now you can go ahead and create data fields. Press 2, tell Quick Gen that you want to add or delete a field to the primary file or secondary file (if there is one), and enter the field name and field type. Screen prompts such as Allow Keyboard Update? Allow Data File Search on this Field? and Enter Display Length let you choose options by typing Y or N in the boxes provided.

In lieu of user input, Quick Gen provides default values for each entry. The system knows that date fields will always have to be displayed in the usual mm/dd/yy form and therefore does not make you fool around with format parameters. To end a field definition and ready the entry screen for a new field, you enter E in the bottom box.

Importing Files

Linking files together to retrieve specific information is easy to do with *probase*, as with most databases. However, unless you are dealing with large databases, it's also fairly easy to do the same thing with paper records and filing cabinets. When you start trying to perform more sophisticated tasks, though, the talents or shortcomings of relational databases become obvious.

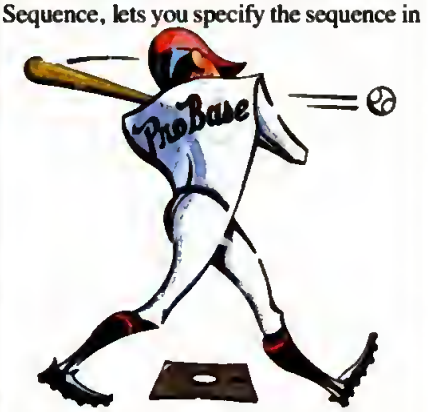
The first task I tried to complete with *probase* was importing data from three record files into "skeleton" files that I created with Quick Gen. *Probase* features a data import/export facility, although the conversion procedure is not documented. The program used is called CONVERT.EXE, and it occupies about 36K on the *probase* designer disk.

According to the on-screen instructions, the CONVERT program will import DIF and *dBASE II* files into and export DIF and *dBASE II* files from *probase*. However, my attempts to load .SDF and .SEQ files elicited the error message Can't Open Input File.

A spokesman at Data Technology Industries knew of no apparent reason why the conversion procedure did not operate correctly. DTI intends to fully document the CONVERT.EXE program in the manual's next printing.

Using Quick Gen, I created equivalents of the files that I would need to input the data, a fairly straightforward task that took about 20 minutes to complete. *probase* does not allow you to use the same field name in separate files that will be linked, so you may have to be creative when you start defining field names.

Once you have created all the field names necessary for a file, the main Quick Gen menu lets you make some decisions about how the end product will operate. For example, option 7, Specify Data Entry Sequence, lets you specify the sequence in which users will be allowed to enter data. If you don't choose to alter the data entry sequence, Quick Gen presumes that you want data to be input according to the order in which you originally defined and created the data fields. Therefore, you must take care that the data entry sequence is not disturbed when you make changes to the number or types of fields in a file.



probase attempts to attract both the user who wants program generators to do all the work and the skilled programmer.

Once you have created an operational database, any changes to the size and number of fields in that file will erase its contents. It pays to design a file carefully and see how it works with dummy data before you commit any real resources to it. Once you are happy with the way your file looks, you return to the Command? prompt.

If you type EX (for execute), *probase* asks for the name of the application you wish to run and the disk drive on which it can be found. Once you have supplied the correct data, *probase* will display the screen you created with Quick Gen. Along the bottom of the display is a standard *probase* menu that allows you to read all records sequentially, read specific records according to a combination of conditions, add new records to the primary file, or add new records to a secondary file.

Selecting the Add Primary option from this menu updates the menu display so you can move from a completed record to a new blank record, move back to the previously entered record, cancel updates of the current record, delete primary and/or secondary records, or print the display.

An Index of a Sort

I entered data into my imported files and then decided to order the first file by last name and the second file by employee number. On reading the documentation I was surprised to find that *probase* only provides for indexing a file as opposed to actually sorting.

When you sort a file, its contents are physically shuffled according to a specific key or combination of keys. On the other hand, when you index a file its contents remain in the same order, and a totally separate index file—containing information on the order in which data should be stored or retrieved—is created and saved to disk. Data can be found more quickly in a sorted file, because records are stored in a logically sequential order. An ideal database would, of course, provide both indexing and sorting and let you choose.

To index a *probase* file, you must

Micro Flash is Reliable

- In our 4th year of business *(One of the Originals!)*
- Positive buying power within the industry meaning well-stocked inventories and a consistent supply
- A reputation as specialists in the business and corporate marketplaces
- A dedicated approach to honest customer service

Micro Flash Guarantee

- We sell the latest versions
- We support what we sell
  We won't tell you to call the publisher or manufacturer for after-sale support.
  We want you to call us!
- We won't sell you anything we don't think you need
- If the product is defective when you receive it—we'll replace it!

Micro Flash Terms

- MasterCard or VISA—with no credit card surcharge added
- Mail Orders accompanied by certified or cashier's checks
- Call our Credit Manager for information on institutional purchase orders
- All returns must have a Return Authorization Number
- $100.00 minimum order
- Products and prices subject to change without notice

Micro Flash Shipping

- $6.00 for UPS surface (except for printers and monitors)
- Add $3.00 per item for UPS 2nd Day Air
- All shipments fully insured at no extra charge
  Call for information on foreign orders, US Mail, CODs
- Overnight delivery service available

PRODUCTS FOR IBM PC & COMPATIBLES

HARDWARE & PERIPHERALS	RETAIL PRICE	MICRO FLASH
AST Research SixPakPlus 64K	$ 395.00	299.00
64K Ram Chip Sets "$1 per K"	100.00	64.00
CDC 9409 OS/00 Disk Drive	525.00	249.00
Davong 10 M8 External	2395.00	1795.00
Hauppauge 8087 Chip	175.00	157.00
Hayes Smartmodem 1200	899.00	489.00
Hercules Graphics Card	499.00	369.00
Panasonic Half-Height Drives	495.00	189.00
Paradise Multidisplay Card	599.00	489.00
Printers—Epson, Oki, Diablo, NEC, Toshiba, Brother, Others		$CALL$
Princeton Graphics		
Max-12 Amber Monitor	249.00	189.00
HX-12 Hi-res RGB Monitor	695.00	524.00
SR-12 Super Hi-res RGB Monitor	799.00	929.00
Scan Doubler	249.00	214.00
PTI Datashield Power Supply	359.00	329.00
Quadram Expandable Quadboard	295.00	239.00
Diskettes—3M, Dysan, Others		$CALL$
SOFTWARE		
Ashton-Tate dBase II*	$ 700.00	$379.00
FRAMEWORK	695.00	549.00
BPI Systems Accounting* (ea. mod.)	595.00	398.00
Continental Home Accountant Plus*	150.00	94.00
DayFlo (for IBM PC XT)	495.00	371.00
Fox and Geller QUICKCODE*	295.00	179.00
Human Edge Sales Edge	250.00	199.00
Microrim Inc. R:base 4000	495.00	349.00
Microsoft* Multiplan™*	195.00	149.00
Multi-Toot™ Word with Mouse	495.00	348.00
Multi-Tool™ Cash Plan	125.00	94.00
Basic Compiler*	395.00	279.00
Business Basic Compiler	800.00	418.00
C Compiler	500.00	349.00
Pascal Compiler	300.00	224.00
Fortran Compiler*	350.00	244.00
Cobol Compiler*	700.00	519.00
Sort Facility*	195.00	149.00
Macro Assembler	100.00	74.00
Project	250.00	198.00
Microstut Crosstalk XVI	195.00	119.00
MultiMate Int'l MultiMate	495.00	299.00
Peter Norton Utilities	90.00	55.00
RosaSoft ProKey Vers 3.0	129.95	95.00
SPI Open Access	595.00	475.00

*Also available in Apple II Format

PROOUCTS FOR APPLE MACINTOSH

Davong MacDisk 10 M8	$2395.00	2059.00
Microsoft* Multiplan™	195.00	148.00
Basic Interpreter	150.00	122.00
Chart	125.00	99.00
Word	195.00	149.00
Maxell 3½" Diskettes	7.10	9.00

Member: Better Business Bureau, Chamber of Commerce
Listed: Dun & Bradstreet

Many other products available at comparable discounts! Quantity pricing available

For product information, price quotes, technical support and California orders, please call

415/680-1157

To order from outside California, call

800/458-2433

MICRO Flash™
COMPUTER SYSTEMS

1110 Burnett Avenue, Suites J & K
Concord, CA 94520

CIRCLE 315 ON READER SERVICE CARD

Fast and restless.

The new Delta-15 printer kicks out AnyCalc, easy as 1,2,3!

In a 9 to 5 world full of changing spreadsheet data, you need a business printer that moves fast. A printer that constantly fires out printed information. A printer called Delta-15.

Delta has the ability to print multi-copy spreadsheets at an intense 160 cps. Its throughput never rests. In fact , it never even wavers in speed. That means that Delta constantly fits the most work into every single second.

Delta comes in a 10" or 15½" carriage size. It offers you the flexibility of standard 8K parallel and serial interface. And has the ability to underline, accept macro instruction, and print characters that range from full graphics to everyday printing to scientific notations.

Plus, as always, you get our unique 180 day warranty (90 days on print head).

So for everyone who needs their spreadsheet data "yesterday," this is as close as you can come! The new fast and restless Delta-15 business printer from Star.

star™
micronics·inc

THE POWER BEHIND THE PRINTED WORD.

Computer Peripherals Division
P.O. Box 612186, Dallas/Ft. Worth Airport, TX 75261 (214) 456-0052

CIRCLE 396 ON READER SERVICE CARD

return to the Command? prompt and type RC to return control to the operating system. Once the A> prompt appears, you type the command INSURE to activate the indexing program. You must supply the name of the file to be indexed, the drive on which it is stored, and the drive on which you want the new index file to be saved (it need not be saved on the same disk as the database file). Next, you must enter the key index field and any subindex fields (up to three subindexes).

You have no direct control over the manner in which files are indexed; *probase* simply goes ahead and places records in ascending alphabetical or numeric (ASCII) order on the basis of the first 16 characters in a field. At times you might want to index file contents in descending order, but most people can probably live with the *probase* approach.

Having indexed my two files, I created a third file that would contain mathematical computations. Option 6 on the main Quick Gen menu, Define/modify calculations, allows you to mathematically manipulate the contents of one or more fields to produce a completely new result. Computations can be carried out between fields or between fields and numbers.

Cumbersome Calculations

I arranged the new file so that I'd only have to enter data in five fields, called Employee Number, Present Salary, Date of Change, and Percent of Increase. Two fields, Amount of Increase and New Salary, would be calculated automatically. The formulas are set up similar to calculations on a spreadsheet.

To obtain the Amount of Increase field I subtracted Present Salary from New Salary, but I immediately found that this approach didn't work too well. If I changed the value of the Present Salary, the Amount Increase field always seemed to reflect a *previous* change instead of the change just made. Presumably, some of the internal variables were not being set to zero correctly. When I tried some other alternatives, *probase* began to object; it would either become locked into a loop or return me to the DOS prompt. The problem was that I was inadvertently trying to divide by zero.

I adopted the following cumbersome alternative: Amount of Increase = New Salary − (Present Salary−Present Salary +Present Salary). This seemed to do the trick. To generate the New Salary amount, I used the formula: New Salary =((Present Salary/100)*Percent Increase)+Present Salary.

Probase's computational abilities within Quick Gen are limited to addition, subtraction, multiplication, and division. These suffice for many simple applications, but the powers of logical operators such as equal to, greater than, and not equal to, would be useful. Unfortunately, you can only apply logical tests when using the Report Gen program to selectively extract data from files.

Before you do any work within Report Gen, make sure you have created all the indexes for the files you are about to use—or you could be in for some surprises when you try to print out.

Report Gen allows you to design output forms that use data from up to three *probase* files. Additional files can be included if you use the *probase* macro language.

Before you do any work within Report Gen, you must make sure that you have created all the you will need indexes for the individual files you are about to use—otherwise you could be in for some unpleasant surprises when you try to print out information. Records could appear in the incorrect sequence or, with larger databases, it could take ages for anything to happen. At worst, nothing but a lot of disk gnashing will happen.

Report Gen allows you to link primary and secondary files in a one-to-one, many-to-one, or one-to-many relationship. A third file, if used, can be linked to either the primary file or the secondary file as well, but it can have only a one-to-one or a many-to-one relationship with either file.

Data from primary file fields can be placed anywhere in a ten-line deep area starting from the top of the screen. Text labels can be included next to where the field data will appear. When there are multiple secondary records for each primary file record, the secondary information is relegated to the special 5-line deep printout area so that there will be no conflict between fields as they print out one below another. However, if there is only one secondary record for each primary record, you can mix secondary file fields with the primary fields. Fields from the third file can be displayed in the primary data area only if there are no multiple records in that file.

Report Gen clearly has limitations. You cannot develop an output form that contains primary record data, multiple records from a secondary file and multiple records from a tertiary file. The reports I created with my test data produced the expected results, but when you are designing an application in Quick Gen or Report Gen you must be aware that if you create a two-file application, the primary file records will be displayed only if there is a matching secondary or tertiary file record. Likewise, with a three-file application, primary file records will only be listed if there are both matching secondary and tertiary records. I occasionally had to resort to *probase's* macro language in order to get things to look just right.

Report Gen also provides the means to set up record-selection criteria at report-

generation time. For each report you can use up to six logical conditions, which can be fixed or which you can set at runtime via user prompts. Six logical tests are available (equal to, not equal to, less than, greater than, less than or equal to, and greater than or equal to), and conditions must be true for the required records to be printed.

Menus for Users

After you're gone to the trouble of setting up all the Quick Gen and Report Gen applications, it would be unfortunate if you still had to type Ex (for execute) or some other *probase* command every time you wanted to enter or retrieve data. With the third program generator, Menu Gen, you can create a numbered menu screen that will automatically find files depending on user selections. A Menu Gen program can be automatically loaded if you save it under the name STARTUP on the *probase* system disk in the A: drive. Passwords can be used on applications that you want to protect.

If you wish to make major modifications to a Quick Gen or Report Gen application or create a *probase* application from scratch, you must use *probase*'s special macro language. There are three main programming tools for the *probase* programmer: the Procedure Table, Calculate Set, and Select Parameters Set.

The Procedure Table contains the main macro instructions, and although the format may seem a little strange, there are obvious similarities to code written in the BASIC and Pascal languages. The macro instructions are written sequentially, and unless the program encounters special JUMP ON CONDITION statements or calls to the Calculate Parameters and Select Parameters sets are encountered, it performs the instructions sequentially.

Among the macro instructions a *probase* programmer can use is the S command, which tells *probase* to look for a screen file. On finding the screen file, *probase* will display the data field labels that you painted on the screen earlier and saved to disk. To actually display some data, you must tell *probase* to get the next record from the appropriate file.

The display entry will actually list the various data fields. In telling *probase* what to display, you must also tell it how long the data field is and where on the screen you would like it to appear.

Another macro command is JUMP (entered by typing J), which can act as both a simple LOOP instruction and an IF-THEN-GOTO statement, as in conventional high-level languages.

Since the Procedure Table is rather cramped, some additional parameters can be lodged in a completely separate table called the Select Parameter Set. This table is used to arrange tests between values temporarily placed in a *probase* variable and some fixed value (numeric or text). Entries essentially take the form

```
01 Variable 1 = Value 1
02 Variable 1 = Value 2
03 Variable 1 = Value 3
```

and so on as necessary. Decks of such lines can be operated on with Boolean logic if one line is not enough.

A JUMP statement in a Procedure Table can force a switch to a logical test contained in a Select Parameters Set. If the test condition is true, then subsequent actions occur according to where the JUMP statement forces the program to go next. If the condition is false, *probase* moves on to the next macro statement in the Procedure Table.

The Calculate Parameters Set is used to create calculations such as Field1 * Field2 = Result Field. The main Procedure Table program dips into a Calculate Parameters Set when it encounters a Calculate statement. The main program knows which lines in the Calculate Set it should go to by the number entered in the Size or Calc column.

A few other assorted tables can or must be used by the *probase* programmer. While the use of macros in formatted tables is theoretically a sensible deprogramming technique, I didn't feel comfortable with it.

In writing BASIC programs, you can ramble on without any concern for either program efficiency or readability. The probase technique does not overcome these problems.

In writing programs in BASIC and other high-level languages, you can ramble on without any concern for either program efficiency or readability. The *probase* technique unfortunately does not force you to overcome these problems. In fact, trying to follow the flow of control while reading some Procedure Table code that I generated via Report Gen was a bit like watching a bouncing ball. Dividing program subsections into separate calculation and selection tables didn't help much either.

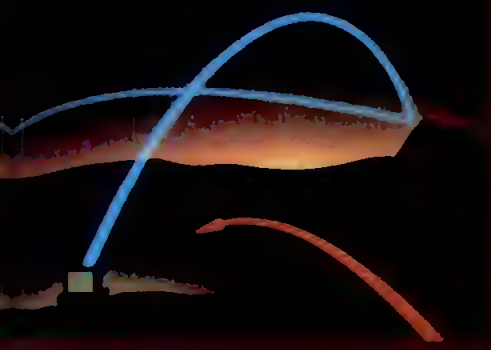
You can purchase *probase* alone, without the generator modules, at a reduced price, but all you will get is a programming environment. Unless you are truly interested in programming your own database management systems, you'll need to have Quick Gen, Report Gen, and Menu Gen as well.

But the generator modules don't shield you completely from the need to program in *probase*; to use it to its fullest potential, an understanding of its many programming features is essential. Unfortunately, these programming features—and particularly their organizations—are *probase*'s weakest points.

—**Robin Webster**

(continued)

MAKE THE CONNECTION...IN THE SLOT



Now you can plug the ease of use and leadership features of e POPCOM™ personal communications modem directly into one of the expansion slots of your IBM PC, XT, Portable, or IBM slot compatible computer.

With the new POPCOM modem from Prentice Corporation...

- Your personal computer becomes essentially a voice and data workstation, and the need for costly extra telephone lines is eliminated.
- Activity on the phone line is detected (most modems don't do this) and the costly extra load placed on your company's internal phone system is reduced.
- You communicate at the fast, economical 1200 bps rate as well as the standard 300 bps rate.
- Telephone numbers you have selected are automatically dialed and redialed if busy, and incoming calls are automatically answered.
- You have compatibility with the popular communications software packages of today, *and* advanced features that will let you take advantage of the next generation of communications software as well.
- Only one slot in your PC, XT, or Portable is required.

With e suggested retail price of $445, the C100 means real price/performance. All of these leadership performance features are also available in the external POPCOM X100 modem so now you have e choice...inside or outside.

See your local dealer for more information, or contact
PRENTICE Corporation
266 Caspian Drive
P.O. Box 3544
Sunnyvale, CA 94088-3544
(408) 734-9855

PRENTICE Corporation

CIRCLE 147 ON READER SERVICE CARD

POPCOM™ C100 MODEMS

POPCOM ™ is e trademark of PRENTICE Corporation
IBM is a registered trademark of International Business Machines Corporation
© 1984 Prentice Corporation

BUYING A PASSWORD™ MODEM CAN SAVE YOU UP TO $250. AND THAT AIN'T HAYES!*

You can bank on it. Your outlay will be less than if you settle for our major competitor, but not your output! A Password™ modem sends and receives up to 120 words a minute. Provides both 1200 and 300 baud capacity. Offers total interchangeability that lets you transmit information from any make microcomputer to any other make. And your investment is protected by a 2-year warranty.

Unlike our major competitor, Password™ delivers operating simplicity, plus the convenience of uncommon portability. Thanks to lighter weight, it goes almost anywhere. And because of the ingenuity of Velcro™ strips, it attaches wherever you need it, from the side of a desk to the side of a computer!

This means that Password™ doesn't tie you down, and its price won't hold you up. It features auto-dial, auto-answer, and even knows when to disconnect. If you're cost conscious, but refuse to sacrifice high-speed capability and performance, hook up with the right modem—Password.™ The smart decision.

PASSWORD™
by U.S. Robotics, Inc.™

1123 W. Washington
Chicago, IL 60607
Phone: (312) 733-0497

CIRCLE 498 ON READER SERVICE CARD

*Based on suggested retail price comparisons of U.S. Robotics, Inc. and Hayes Microcomputer Products, Inc.

PROJECT DATA BASE

METAFILE: The Price Isn't Right

```
Proc:                A:STDFORM  Data: C:G3RESULT Rec: 0 of 0

LASTNAME       :
EMPLNUM        :
DEPTNAME       :
SALARY         :

                                        ITEMS

                                    Space Used: 3%

                                  Items in C:G3SALARY

                          Pos Type Len  Name
                            1   C    6  EMPLNUM
                            2   N    9  SALARY
                            3   N    9  CHANGE_AMT
                            4   C    2  CHANGE_MONTH
                            5   C    2  CHANGE_DAY
                            6   C    2  CHANGE_YEAR
                            7   N    4  PCT_INCREASE

Proc:                A:STDFORM  Data: C:G3SALARY Rec: 1 of 680
```

METAFILE screen showing characteristics of salary file fields.

I reviewed *METAFILE* earlier this year (see "The Metaphysics of METAFILE," *PC*, Volume 3 Number 7), and now I'm reviewing it once again. Here's the rest of the story.

METAFILE, like many database managers, can be operated in one of three ways: from full prompting menus for beginners or the forgetful, from the command line for the user with medium experience, and from procedures for the advanced operators.

The menu system is one of the best I've seen. It is aptly named the Assistant, and it's a real timesaver for the new user. The Assistant menu system will lead you all the way through *METAFILE*'s capabilities. The Assistant has one powerful, unique feature that allows you to access any of *METAFILE*'s features while already deeply involved with a command. This feature lets you examine or update records on one file while modifying records in a second file. While performing one task, you can simply call up the Assistant and ask it to do another task, start to finish, and then jump back to the original job. This proves invaluable in many situations. The Assistant is your avenue into *METAFILE*'s calculator, directory utilities, active system and database status reports, and command menus.

Any of the commands on the Assistant menu can also be entered from the command line. Even if you use the menu system part of the way, you can finish with commands entered on the command line. Once you are familiar with the commands, using the command line is a much faster method of working with databases.

The third mode of operation uses a procedural language that automates data entry and reporting by combining commands and other subprocedures into one file to be executed from the command line.

METAFILE, Version 7.0
Sensor-Based Systems
1701 E. Lake Ave.
Glenview, IL 60025
(800) 323-3731
(312) 724-0310
List Price: $995
Description: Relational
Requires: DOS 1.1, 128K RAM, two disk drives
Records per File: 32,000

CIRCLE 745 ON READER SERVICE CARD

Data Entry/Modification

The first step in any database design is to describe the different fields and their data attributes. *METAFILE*'s DESCRIBE command does exactly this. Once you have named the file that you want to create, a form appears on the screen to prompt you for each field's characteristics.

Once the database has been described, the next step is to select that file for data entry/modification with the USE or IN commands. You can then update, change, insert, or delete records at will. Many commands can be used to place the record pointer anywhere in the file you wish: NEXT RECORD, PREV RECORD, FIRST RECORD, LAST RECORD, POSITION, or LOCATE (which finds a record according to specified criteria). Any current changes to the database since the last "save" can be ignored or included using the DISCARD or KEEP commands.

Data Manipulation

One of *METAFILE*'s strongest features is its SORT capability. It's fast. You can select many different fields to sort (called keys), and they can be changed at any time. There are many "qualification" commands that allow you to access or report only certain records within a database. You might, for example, want to update only the records where the Salary field contains a value greater than $30,000. The FIND command would make only these records active during the sort. Other records can be added to the active ones using the ALSO command. Individual records can be removed from the active list with the DISQUALIFY command.

METAFILE has no consolidation or multiple update commands. To accomplish these tasks, you must use the procedural language, which is a slow interpretive language. For instance, *METAFILE* does not have a command to add, say, 14

to each person's age field. You would have to write a procedure to accomplish this job. When you start updating records in one database file based on values in other database files, you're in for a slow haul. The procedural language, combined with the text processor, is flexible and capable, but it is a turtle.

Data Reporting

METAFILE provides a variety of report types. The ITEMIZE command produces a record-by-record report. A columnar report can be created using the LIST command. A LAYOUT feature helps to easily create multicolumn listings of names and addresses for labels. And you can create a report that's as complicated as you want with *METAFILE*'s procedural language.

The procedural language, in unison with the text processor, provides the most flexibility and power by far for data reporting. There are many report-formatting commands to set pitch, form size, copies, footers, headers, page width, page depth, spacing, indenting, and the report destination (screen, printer, or text file). The text processor allows you to take these formatting commands and other conditional commands and combine them in the midst of regular text such as a letter or report. The records can be sorted and evaluated, and specified records and calculations resulting from those records can be inserted anywhere in the text. This provides an easy way to produce form letters or other standard correspondence.

METAFILE's flexibility lies in its conditional clauses, formulas, and functions. The conditional clauses include IF/ELSE, WHILE, WHERE, and FOR. Each of these conditionals can control the execution of one or many commands in a block. Formulas can be created using the standard math operators plus exponentiation, add/subtract months, comparisons, pattern-matching, and many other operations. There are 29 built-in functions in *METAFILE*, including functions for date and time, parameter-passing, file and record verifications, absolute values, logarithms, random-number generation, and some other helpful functions.

For the most part, *METAFILE* is easy to learn. The Assistant leads you through most everything you need to know, especially when you first start using the package. A program generator that builds a procedure is not included in the Assistant, so learning *METAFILE*'s procedural language is left up to you and the manuals. The CONVERT command, which is supposed to allow you to transfer files in Standard Data Format into *METAFILE* files, is not explained well—I couldn't get it to work at all. Besides the CONVERT command, however, the system operates flawlessly. I didn't lose any data, nor did any of the reports do unusual things like they do with some other databases.

Manual

METAFILE could definitely use a newer and better manual. There are too many details left out, too few examples, and some important points are left out entirely. A good technical writer could do miracles with the *METAFILE* manual. The manual comes in three books: two user guides and a reference guide. The user guides were helpful, but I would have liked to see the example data on the disk. The point is probably for the user to experience data entry, but I would have been satisfied with adding a couple of more records to an existing database. The lessons in the user guides do teach the basics, but what is not in the lessons is hard to find. I would have also preferred to have the information in one 3-ring notebook rather than in three spiral notebooks.

Other Features

METAFILE does have a variety of other nice features. You can create windows for displaying different information or for temporary data entry and prompting. The procedural language can create as many windows as the operator desires—any subsequent displays will occur within those windows. The Assistant itself works in a window and leaves the rest of the screen alone. There is a calculator feature that allows you to try out any functions or computations before using them in a procedure. Another feature, called "Active Context," shows you the present status of all user and system parameters and variables. A communications feature allows you to send and receive data to and from other *METAFILE* users. As you can see, *METAFILE* is not just a plain database.

Strong and Weak Points

METAFILE's strong points are its almost bug-free operation and its powerful database/text processor, which opens the door for a variety of applications. However, I feel that, considering the explosion of powerful and inexpensive databases in the microcomputer market, *METAFILE*'s $995 price tag is too high for what you get. I also found it a real hassle to accomplish data consolidations with multiple files. Although it can be done with the procedural language, it takes forever since it uses an interpretive language that's even slower than BASIC. If the manufacturer were to clean up the manuals and reduce the price from $995 to $295, *METAFILE* would be a good, competitive package. Maybe $395 would be a reasonable price if the text processor were upgraded to make it a full-fledged word processor. But until the package is improved or the price comes down, *METAFILE* gives a rather slow return on a big investment.

—George D. Hughes, Jr.

(continued)

Do it yourself!

When developing effective applications for the PC is a matter you want to take into your own hands, first get your hands on the APL★PLUS®/PC System from STSC. This unique application development tool gives you the power to deliver totally integrated, highly efficient solutions to problems that conventional software simply can't handle.

The APL★PLUS/PC System is the most advanced application development system available today. And it includes enhancements for the professional, hobbyist, or novice programmer.

—Advanced *screen management facility* with windowing and scrolling features.

—Complete *on-line HELP facility* for novice users.

—Powerful *communication capability* for moving data between computers.

—Comprehensive *color graphics capability, and much more.*

Because of the efficiency of the APL★PLUS/PC System, you can develop programs 4 to 10 times faster than with conventional languages like BASIC or FORTRAN. And the system can be integrated with other applications you've already bought, or used to link those that aren't speaking to each other. It doesn't demand that you abandon those skills you've learned or the software you've come to love. But it does enhance your programming power, so you can do what you do even better!

Get the advanced capabilities of the APL★PLUS/PC System for only $595.00, a valuable investment when you can have things done your own special way. To order the APL★PLUS/PC System see your local dealer or contact STSC, Inc., (800) 592-0050, 2115 East Jefferson Street, Rockville, Maryland 20852.

STSC
A Contel Company

The APL★PLUS/PC System runs on the IBM PC with 192 KB of RAM, as well as on a number of compatible machines.

APL★PLUS is a service mark and trademark of STSC, Inc., registered in the United States Patent and Trademark Office and in certain other countries.

CIRCLE 431 ON READER SERVICE CARD

Hard Right

When you're last to the party, you better bring something special. Like a 10 Megabyte Winchester for $888.

You could safely say we are just about last to the Winchester add-on party. For two years we have searched for the right components at the right price. Anybody can buy controllers and drives, make up a name, and presto, they are in the hard disk business. But to do it right, takes much more than just bundling the nearest components.

Anybody Want a V-8?

Adding a hard disk to an IBM PC can be very much like stuffing a V-8 engine in the back seat of your VW bug. There is room to put it there, and you will have one fast beetle—but you create a whole new set of problems. Like excessive power drain which results in heat.

Cool & In Control

Qubie' has attacked the power/heat problem with a state of the art controller and drive that draw less power than any on the market today. Start with our controller. It is three times faster than the controller in the IBM PC/XT. The controller uses LSI (Large Scale Integration) technology to lower the number of components on the board. Fewer components require less power. Less power means less heat. More power left for other expansion boards, and lower operating temperatures inside your PC. Don't forget our low power drive. It draws the same amount of power as a floppy disk, and is the lowest power consuming drive on the market today.

Sitting Or Standing

Since PC's seem to be getting more and more portable we decided we selected a drive that can be used in the desktop or portable PC. Our drive uses plated media. Plated media can stand up to the rigors of the real world. Special design of the drive allows it to operate at any angle. No need to treat your PC like a piece of antique china just because you have added a hard disk.

Complete Package

Included in the package is everything you need to install it yourself. A 10mb Winchester drive, controller, cables, mounting hardware, and step by step instructions to explain the installation. You can use PC-DOS version 2.0 or 2.1 without any modifications.

Why Buy From Us

Because besides having the best hard disk system on the market, we stand behind it and you. You get direct technical support after the sale. If at any time during the one year warranty period your system should require service, we will fix it or replace it within 48 hours.

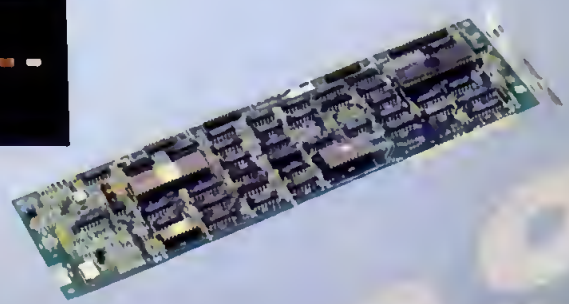
Notice there are no hidden charges in our price. No extra for freight, credit cards, COD fees, or insurance. If you still are not convinced, and are ready to buy another brand of hard disk, ask them if they will take our acid test.

The Acid Test

Qubie' gives you a 30 day satisfaction guarantee on our hard disk system. If for any reason you are not satisfied with your purchase, you may return it for a complete refund including the postage to return it. If you can, get any of our competitors to give you the same guarantee. Buy both and return the one you don't like. We know which one you will keep.

Qubie' PC10 with 10 Megabyte hard disk, controller, cables, installation hardware, and instructions. 1 Year Warranty. $888

IBM is a trademark of International Business Machines Corporation



Plated Media for Rugged Performance

Order Today, Shipped Tomorrow!

All prices include UPS surface freight and insurance. Add $12 tor two day air service. For fastest delivery send certified check or credit card. Personal checks take 18 days to clear. Calif. residents add 6% sales tax. Corporations and Institutions call for purchase order details.

(800) 821-4479
Toll Free Outside California

(805) 987-9741
Inside California

QUBIE'

4809 Calle Alto
Camarillo, Ca. 93010

Tempo House, 15 Falcon Road,
London SW11 2PH, United Kingdom

Copyright Qubie 1984

CIRCLE 384 ON READER SERVICE CARD

PRO-MATIC: Follow the Flashing Screen

```
                    REVISE FILE STRUCTURE:  persondb
 NO DUPLICATE DATA RECORDS ALLOWED                  SIZE .. 87 / 937 REMAINING
DATA ITEM NAME        CLASS        DECIMAL POS     LENGTH       FILE SED      INDEX
fname                 ALL CHARS      N/A            1-11          2A
lname                 ALL CHARS      N/A            1-15          1A           KEY1
empno                 NUMERICS       0              6-6
addr                  ALL CHARS      N/A              30
city                  ALL CHARS      N/A            1-20
state                 ALL CHARS      N/A            2-2
zip                   ALL CHARS      N/A            5-5



              ALL EXISTING DATA ITEMS (ALPHABETICALLY ORDERED)
addr                 city                 empno                fname
lname                state                zip



                         DATA ITEM SELECTION                          * 220 A
          1-SELECT DATA ITEM,2-UNSELECT DATA ITEM,3-FILE CONTROLS
```

PRO-MATIC screen of the employee file structure.

PRO-MATIC consists of two environments: the development environment in which you design and create data fields, files, and application programs; and the run-time environment in which the applications you've developed are actually run, by you or other users.

Although *PRO-MATIC* supports a hard disk, I tested it with a floppy-based system, on which its performance was not too impressive. I had to swap disks constantly and wait long periods between selecting some menu options and actually getting a response. A hard disk system would have spruced up the performance figures and made me less impatient.

Before I started using *PRO-MATIC* in earnest, I booted up the demo disk supplied by RG Software Systems. This disk works either in an automatic mode, in which the screen is updated every 10 seconds or so, or a manual mode, in which you respond to prompts.

The demo disk uses flashing and reverse video characters to show you how to build a database with *PRO-MATIC*. Initially the demo seemed easy to follow, but just beyond the midpoint the examples began to lose their impact, and the flashing characters only seemed to make things more confusing.

I did glean from the demo, though, that *PRO-MATIC* is an extremely visual program that uses highlighting and split-screen displays to communicate with the user. I also learned that *PRO-MATIC* takes over the keyboard for its own purposes, using the function keys and many of the other special keys in unique ways. For instance, the plus key on the numeric keypad becomes the Done or Task Completed key, and the ten function keys select menu options.

Triple Threat

The program itself comes on three disks that contain all the necessary code. Before you can begin to work, however, you must go through an initialization procedure that involves creating a special boot disk and formatting three other blank disks to be labeled *PRO-MATIC* Libraries, *PRO-MATIC* Run-time, and *PRO-MATIC* Databases.

On the Libraries disk you will store a group of files that *PRO-MATIC* will need during the database creation process. You'll also store application-specific data on this disk as you complete programs. The Run-time disk creates compiled versions of the applications you develop with the Libraries disk. Library and Run-time disks must be used as pairs; to run a program developed on a particular Libraries disk, you must insert the matching Run-time disk.

This approach requires careful labeling of disks. If you simply identify each disk as Run-time or Libraries, soon you won't have any idea which one you should insert at the Insert Run-Time Disk In Drive B: prompt.

PRO-MATIC tries to be friendly by asking your name when you first boot up and using it in prompts now and then. But this early sign of good intentions is not followed up as thoroughly as you might wish. The main *PRO-MATIC* menu, which appears next, is filled with confusing keyboard usage instructions. The menu line itself stretches across the bottom of the screen.

PRO-MATIC tries to be friendly by asking your name when you first boot up and using it in prompts now and then.

Four menu options are displayed, but if you press the F10 key more options appear. You select menu items by pressing the relevant function key. I found that I

PRO-MATIC
RG Software Systems
P.O. Box 426
Fort Washington, PA 19034
(215) 576-0970
List Price: $595
Description: Relational
Requires: DOS 2.0, 256K RAM, two disk drives,
Records per File: 32,767

CIRCLE 748 ON READER SERVICE CARD

had to overcome the urge to use the numeric keypad or main keyboard numeric keys, but the system merely beeped a complaint when I mistakenly tried them.

You must quickly learn that the Esc key is the Quit key, and the numeric pad's plus key is the Done key. You'll need these keys often while developing fields, files, and programs.

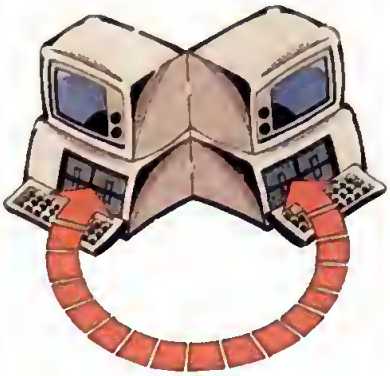
Basic Components

The three basic components of any *PRO-MATIC* application are data items, file structures, and either an accessory model or a program model. Let's first look at the way in which you create a pool of data items, or fields, to include in a file structure. The pool of data fields is referred to in *PRO-MATIC* as a "data dictionary." In a broad sense, the data dictionary is a holding area for information about the structures and types of data available. No actual field contents are stored in the dictionary; it just lists field names, the size and type of each field, the name of the application or applications where each field can be found, and any possible links to other fields.

To begin work with *PRO-MATIC*, I selected option 1 from the main menu and then followed the system prompts until I had entered all the field data. This is a straightforward procedure and should present no problems if you have already listed your field specifications on paper. Field information stored in the data dictionary is always totally separate from the files that will use those fields.

One further step must be taken before a file is created. You must select option 2 (File Structures) from the main menu. When you do so, the screen splits into two horizontal areas: The top area is empty except for some system information, and the bottom area displays all the currently defined fields arranged in alphabetical order, not the order in which you input them. By placing the top area cursor at a required location, pressing a function key, and then selecting a field from the data dictionary, you slowly build a file. You may select any field, but it can only appear once in a single file.

By first selecting the File Controls option and then the Select Sequence Control option, it is possible to set the order in which records will be stored in a file. Data can be stored in ascending or descending order based on a key field plus two subkey fields. If you don't set up an index in this way, *PRO-MATIC* will store all records in the order in which you entered them. If you wish to create a database that contains records with overlapping information (last name, for example), you may specify this overlap at the same time. The default selection is to have no duplicate records at all.



Until this point, only the first of *PRO-MATIC*'s three disks has been used. To set up the code necessary to enter and retrieve data from a file, you must select the Accessories Kit option and respond to the prompt, Insert the Disk Marked #3 in Drive A:.

After swapping disks, you are faced with what looks like the main menu again. Although the screen is similar, the menu now offers many additional features. If you want to add, retrieve, change, delete, or just list records, you must select option 1, the query/update procedure. After providing a name for the model you are about to create, you then select the file structure that will be used during all query/update sessions. Selection is again made via a split screen display; the top half shows the new information you are entering, and the bottom half shows a list of all existing file structures.

Importing Data

At this stage you can either enter new data or import existing files. To import data into *PRO-MATIC* you must use the Convert to *PRO-MATIC* option listed in the Accessories Kit menu. This conversion procedure automatically takes DIF format information into the Pro-Matic environment. A reverse procedure, Convert from *PRO-MATIC*, will take *PRO-MATIC* files and create DIF format copies on disk.

The conversion utility asks for a model name and then goes off to set up the necessary code to do the job. The setup takes no more than 5 minutes to complete. Two types of file formats were provided by *PC Magazine:* a set of .SEQ files that contained pure data field information separated by spaces and a set of .SDF files in which the data fields were contained within double quotes and separated by commas.

The import/export procedure is not lavishly documented; for example, the manual does not explain that ASCII files must have the .ASC extension to be imported. That's no big problem unless you find out only after you are locked into the conversion procedure—as I did. I was disappointed that *PRO-MATIC*'s documentation and screen prompts didn't inform me of the .ASC requirement in good time. After renaming the relevant files, I tried the conversion procedure again with the import model I had previously saved.

I first attempted to import the .SDF files. Everything seemed to be going fine until the conversion stopped after about 18 minutes with only 470 records out of 500 records entered. When I checked the file I realized that *PRO-MATIC*'s ASCII import feature hadn't liked the double quotes and commas as delimiters. The fields were all garbled and out of sequence and double quotes and commas were everywhere. My

INTRODUCING PINWRITER DOT MATRIX PRINTERS. AND A HEAD TO HEAD COMPARISON OF WHY THEY'RE BETTER.

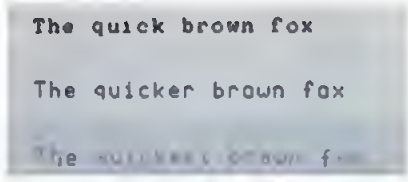
Our new multi-mode Pinwriter® dot matrix printers have a lot in common with our Spinwriter® letter-quality printers. Designed and manufactured with the same quality and reliability that has made our Spinwriters the best selling letter-quality printers to PC users. We also gave them many unique capabilities you won't find on other dot matrix printers. Especially at such an affordable price.

More dots, more fonts, more versatility.

One thing that makes Pinwriters stand out from other

Our exclusive 18-pin print head is graphically sharper than a 9-pin printer, as this unretouched photo shows.

dot matrix printers is our printhead. It has 18 pins. Compared to the usual nine. It also has true dual-pass printing. The result: an amazing 240x240 dots per inch.



Three speeds cover all your printing needs.

That's why the print is as close to letter quality as you can get without getting a Spinwriter. And why charts, illustrations and graphics look so crisp.

Our new P2 and P3 dot matrix printers give you everything our Spinwriter letter-quality printers are famous for, including forms handlers.

Pinwriters have something else no other dot matrix printers have. Eight operator-selectable print styles, plus as many as 11 international character sets. And an LED display to tell you which style has been selected.

What else? Three printing speeds. 300, 900 or 1800 words per minute to handle all your printing needs from word processing to data processing.

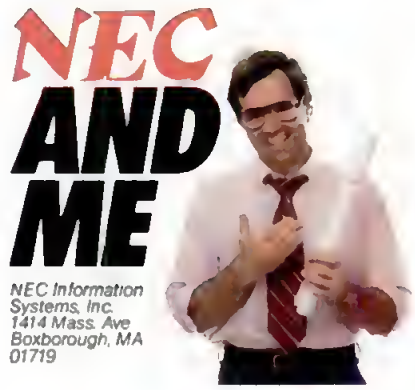
Plus, a variety of forms handlers to speed up all your paperwork. All made and designed by NEC. And all easily installed and changed by the operator.

For the final word, see your NEC dealer.

Only a demonstration can show you how clearly superior the Pinwriter is compared to other dot matrix printers. And how versatile it is.

For the Pinwriter retailer nearest you, call 1-800-343-4419. In Massachusetts call 617-264-8635.

And find out why more and more PC users are saying, "NEC and me."



NEC Information Systems, Inc.
1414 Mass. Ave
Boxborough, MA
01719

Pinwriter and Spinwriter are registered trademarks of NEC Corporation.

CIRCLE 170 ON READER SERVICE CARD

attempt to import the vanilla ASCII files met with no success either—after 20 minutes the conversion stopped short of the 500 mark.

Building Program Models

Actual application programs are created in *PRO-MATIC*'s programming environment. Although you can dictate what appears on the computer screen and which files are read next, PRO-MATIC, for example, automatically builds the program structure with a set of standard program statements.

First, you create all the data fields you require, presuming that they are not already available from the data dictionary. Next, a screen format has to be painted on the screen as you wish it to appear in the end-user application. Three types of data displays are possible: the form, the list, and the menu.

A form is used when you wish to output the contents of one or more databases to the computer screen or an attached printer one record at a time. Data can also be entered into selected record fields. The list style of data display is useful when you want the ability to list multiple records from a single database at one time on the screen or a printer.

The most flexible data display is the menu, which provides you with the ability to list multiple records from a database and to then select specific records for data entry or updating. Forms can be linked to menus so that a single menu listing can provide access to more detailed information held in various files.

The *PRO-MATIC* method of painting the screen with data fields is similar to other systems, but the data fields available are displayed in the lower half of the screen. *PRO-MATIC* allows you to use the values stored in data fields for simple computations. Calculations can add two fields to produce the value in a third field or increase that of a single field by a specific amount each time a condition is met.

PRO-MATIC's "processing sequence" feature turns simple data into applications. If you select the Program Models option at one of the main menus, you will be confronted with a split-screen display. The bottom half contains all the available procedure models; the application program, or processing sequence, will be built in the top half.

Using the processing sequence feature is a bit like painting by numbers. Initially the top half of the program development screen is quite bare. It contains only a couple of basic statements: Create New and Start of Program Model. The various programming statements are invoked via the Select Procedure option on the menu along the bottom of the screen. Using the Special Commands option you can also set up a processing command that will query the data entry operator for specific information. If you were to build a personnel database to report on salary levels in all company departments, it might be useful to provide on-screen prompts that ask the data entry operator questions like, "Which department roster would you like to view?" or "What salary level do you wish to search for?"

The import/export procedure is not lavishly documented; for example, the manual does not explain that ASCII files must have the .ASC extension.

The Define Decisions option provides the ability to carry out logical tests on data. The form

```
IF salary IS LESS THAN
OR EQUAL TO 30,000
```

would test the value entered to see if it were equal to the preset amount. If not, other conditions could be tagged on.

Pros and Cons

With time and effort, full and complex applications can be developed with the *PRO-MATIC* programming environment. I like the idea of allowing the user to enter the application-dependent information—file and field names, for example—while *PRO-MATIC*, like a vending machine, dispenses program statements. I also like the way *PRO-MATIC* uses split screens to indicate what currently existing resources are available for application development.

The documentation is thorough with lots of examples, but it seems to assume that you will read it from beginning to end, simultaneously carrying out all the exercises. Beginners and database jocks alike should give every section a once-over because *PRO-MATIC*, like every database system, tends to have its own way of doing things.

I have three major criticisms of *PRO-MATIC*. First, despite the fact that it is a very visual system, the screen designs can be confusing if you've created many data fields and files. Second, since *PRO-MATIC* is supplied on three system disks from which you must create at least three more, keeping track of which disk should be where and what they are called is a full-time job in itself. I began to feel like a card-shark dealing a hand. Finally, *PRO-MATIC* is something of a Rip van Winkle; every now and then it goes off into a comatose state.

PRO-MATIC is certainly chock full of features. Such features, however, are useful only if they can be easily used to produce fast solutions to complex problems. Here, unfortunately, they cannot. While the program is a powerful one, its strongest points are too difficult to learn and use correctly. The usual power versus ease-of-use conflict has been resolved in *PRO-MATIC*—and the user has lost.

—Robin Webster

FEATURES INCLUDE:
16 Bit CPU
With 128K RAM Memory
Expandable to 256K,
Two 320KB Slimline
Disk Drives,
Floppy Disk Controller,
Monochrome Monitor and
Adapter, Parallel and
Serial I/O's.

BEST OF ALL!
TEN DAYS FREE TRIAL!
ALL YOU PAY IS SHIPPING!

FOR MORE DETAILS
CALL OR WRITE
TO: TAVA CORPORATION
16861 Armstrong,
Irvine, California 92714
714/261-0200
Headquarters/Telex: 181667
Answer Back COMPDSHACK IRIN

CIRCLE 375 ON READER SERVICE CARD

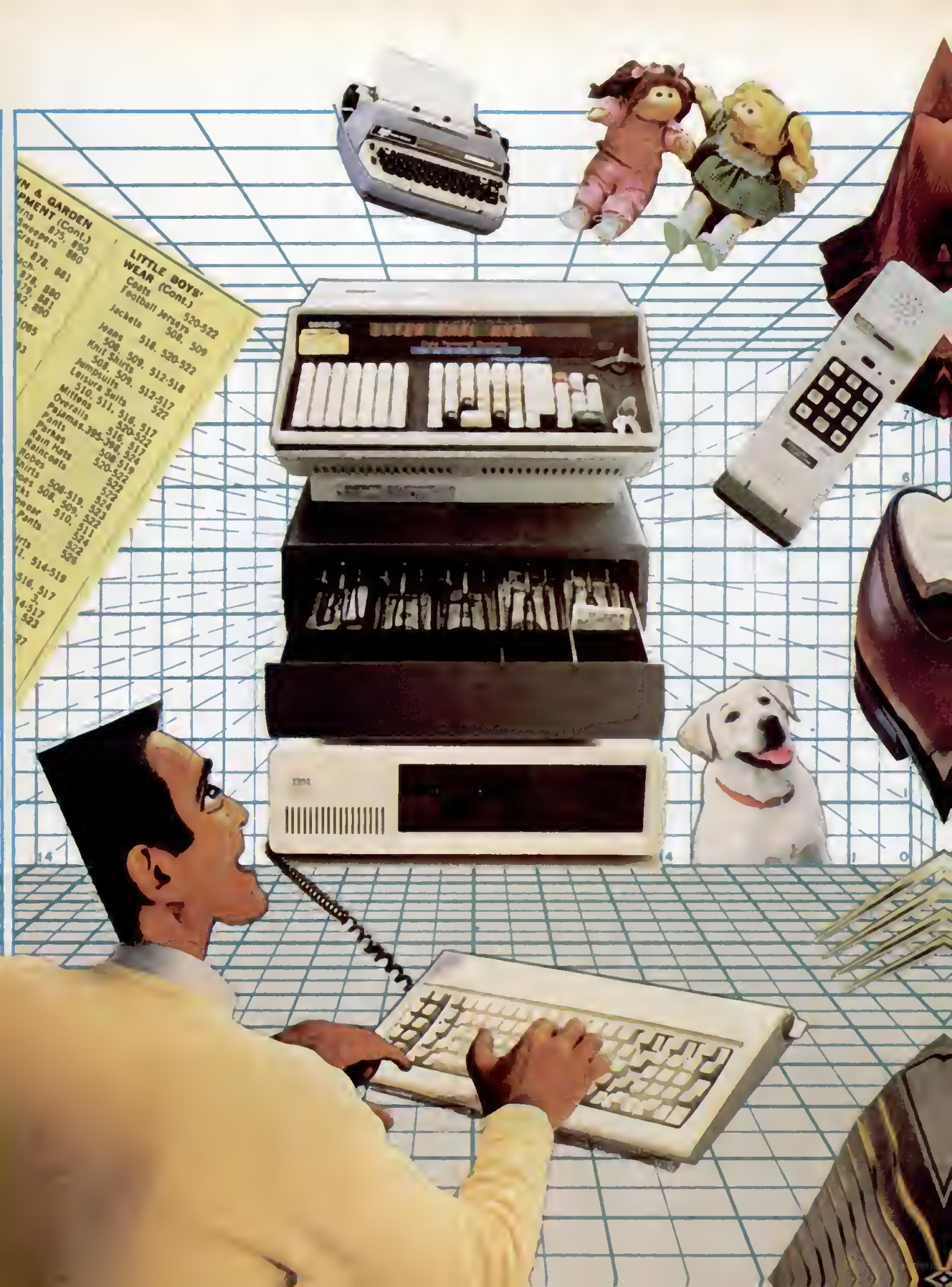
IBM® COMPATIBILITY AFFORDABLE PRICE

TAVA PC

THE SMART COMPUTER USER WANTS REAL VALUE WITH IBM COMPATIBILITY!

THE TAVA PC. The ultimate Personal Computer. It gives you IBM PC® Compatibility at a fraction of the cost. Choosing a personal computer is a difficult decision. But, when your decision is a TAVA PC, it's not hard at all! The TAVA PC runs under DOS 1.1, 2.0, CP/M86®, and p-System®. You can choose from a large library of all the most popular IBM PC software products such as dBasell®, Lotus 1-2-3®, Visicalc® and thousands more.

©TAVA CORPORATION 1983 †California residents add 6% sales tax
dBASE II is a registered trademark of ASHTON-TATE, Inc
LOTUS 1 2 3 is a registered trademark of Lotus Development
CP/M86 is a registered trademark of Digital Research Inc.
UCSDp is a registered trademark of Softech Microsystems
IBM PC is a registered trademark of IBM Corp.
Visicalc is a registered trademark of Visicorp


LITTLE BOYS' WEAR (Cont.)
Coats 520-522
Football Jerseys 508, 509
Jackets 508, 509
Jeans 518, 520-522
Knit Shirts 508, 509, 512-518
Jumpsuits 508, 509, 512-517
Leisure Suits 510, 511, 516, 517
Mittens 522
Overalls 520-522
Pajamas 395-398, 524
Pants 516, 517
Parkas 508, 519
Rain Hats 520-522
Raincoats 522
Robes 522
Shirts 508-519, 523
Shoes 508, 509, 522
Socks 510, 511
Sweaters 524
Underwear 522
Wigs 526
IBM

Inventory Control for Retailers

GPS' Inventory Management with Point of Sale Invoicing provides retailers with the specialized computer help they need to handle customer transactions efficiently.

If you're a retailer, you probably know that most inventory systems are not designed for environments in which sales transactions must be handled quickly and efficiently while the customer is waiting. And turning shoppers away because of long lines at the cash register is hardly beneficial to a retailer.

In a retail operation, the greatest number of transactions affecting inventory occur at the time a sale is being made—that is, at the "point of sale." A package that addresses this need is now available for the PC from Great Plains Software (GPS). *Inventory Management with Point of Sale Invoicing* has been designed to facilitate transactions that occur at the cash register. In its latest release, GPS has included two major enhancements: First, you can now interface your PC directly to a cash drawer, causing the drawer to open when a cash transaction occurs. Second, the system will produce a sales slip, documenting each sales transaction for your customer while automatically updating your inventory records.

In addition to its point of sale routines, the system is full of features to help you control your inventory and possibly improve your sales by tracking inventory item information such as quantity on hand and on order, quantity back-ordered, price promotions, discounts, and inventory

PC BACK SIDE

Inventory Management with Point of Sale Invoicing
Great Plains Software
1701 S.W. 38th St.
Fargo, ND 58103
(701) 281-0550
List Price: $595
Requires: 128K RAM, 5-megabyte hard disk.

CIRCLE 799 ON READER SERVICE CARD

Illustration: Lou Beach

HANDIMAN™ CONQUERS the CABLE MONSTER!

THE NEW ADVENTURES OF

The MAN FROM APSTEK INC

The HandiMan from Apstek™ to the rescue! With his Handi-1 multi-function board for the PC and XT. A board of ultimate features...

- Handy and simple to install durable six-foot round cable
- Increased memory of 64K-256K RAM
- Clock/calendar with 1-year battery back-up, so your clock never stops
- External parallel printer port
- External serial port
- Fits any large slot, allowing room for additional cards
- Print spooler, electronic disk, clock utilities, and diagnostics software
- Optional 0 to 256K memory so you can save money with multi-function now and add memory later as you need it

PLUS UNTOLD OTHERS!

Watch for more exciting adventures of the HandiMan and his arsenal of awesome weapons against computer confusion!

- The Handi-2 board for memory expansion with print spooler, electronic disk and diagnostics software — optional 0 to 256K memory so you can save money now and add memory later.
- The Handi-3 board for addition of a parallel port, with clock/calendar and print spooler software.
- The Handi-4 board for addition of a serial port, with clock/calendar and print spooler software.

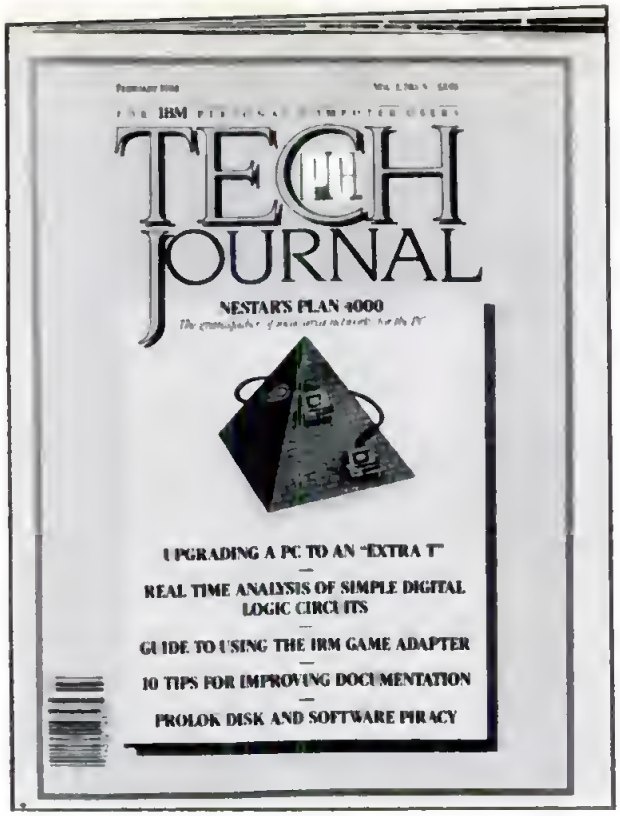
Escape the clutches of The Cable Monster! Demand the Handi-1 at your local computer store or order directly from:

APSTEK INC

2636 Walnut Hill Lane, Suite 335 • Dallas, Texas 75229 214/357-5288

DEALER INQUIRIES INVITED: 214/357-5288

CIRCLE 246 ON READER SERVICE CARD



LET'S TALK EXPERT-TO-EXPERT

PC TECH JOURNAL, the only magazine written for sophisticated IBM PC users...talks with you expert to expert!

Do you require a magazine that provides you with the insight and knowledge to act as your silent partner when developing new programs? Have you needed to consult with authorities in telecommunications to resolve a nagging problem? Wouldn't a second opinion about connecting your PC to a main-frame be helpful? With your subscription to PC TECH JOURNAL, you're harnessing experts in your field... experts who will talk to you in the language you understand, about the concerns you have...EXPERT TO EXPERT!

PC TECH JOURNAL is the technologically sophisticated magazine written for experts in the field of personal computing like yourself...discussing the concerns experts have...developing elegant programming methodologies only experts can understand...covering the whole field of IBM PC's with thought-provoking articles on communications, distributed processing, office automation, networking and programming.

Subscribe today and save up to 36% off the full subscription price, and have PC TECH JOURNAL delivered to your home or office every month! From One Expert to Another: subscribe today!

TECH JOURNAL P.O. Box 2966, Boulder, Colorado 80322 PT8H849

YES, I want to communicate with other experts and professionals about IBM PC's and compatible machines! Please enter my subscription to PC TECH JOURNAL for:

☐ One year (12 issues) for $24.97—SAVE 17%!
☐ Two years for $43.97—SAVE 27%!
☐ Three years for $57.97—SAVE 36%!

Mr./Mrs./Ms._____
please print name in full

Company_____

Address_____

City_____ State_____ Zip_____

Savings based on full one-year subscription price of $29.97.

Check one: ☐ Payment enclosed. ☐ Bill me later.

Charge my: ☐ American Express ☐ Visa ☐ MasterCard

Card No._____ Exp. Date_____

Add $12 a year in Canada and all other foreign countries. Please allow 30 to 60 days for delivery of first issue

turnover rates. At any moment, you can print reports to show exactly what items are in stock, how much of each item you have, how much the inventory cost you, what items are out of stock, and what items are on order from suppliers. The system could also be used in handling the inventory accounting chores for wholesale businesses—especially those with retail-like operations such as mail-order.

The system is part of *Great Plains Hardisk Accounting Series*, which also includes *General Ledger with Budgeting and Financial Reporting, Accounts Payable, Accounts Receivable*, and *Payroll*. Each system can be purchased and used independently or integrated with the others, which will eliminate the process of making multiple entries. The only exception is that when integrating *Inventory* with *Accounts Receivable* or *Accounts Payable*, the *General Ledger* must also be used. GPS has indicated to us that it will soon be releasing a *Job Costing* system, a facility that it calls "Rapid Transfer" (allowing you to transfer your GPS accounting data to programs such as *1-2-3*), and a multi-user version of its *Hardisk Accounting Series*.

The *Inventory* system's functions can be grouped into:

- Inventory maintenance (used to establish and maintain the inventory items you stock);
- Inventory receipts transaction processing;
- Point-of-sale transaction processing;
- Inventory and sales reporting (some 29 different reports for inventory valuation, sales history, audit trails, and so on);
- Various system maintenance routines (allowing you to customize the format of your sales slip and make other minor modifications to the system).

Setting Up

In Figure 1, the first of the inventory maintenance screens, you will notice two fields labeled Prod. Category and Generic descr. The first is a three-character field used to sort and group items of a particular product line. For example, assume you use COM as a product category for all the computers you stock, and one of your wholesale customers wants a price list for computers only. A price list could be printed for the COM product category alone—as opposed to producing a price list of all the items you stock. "Generic description" is a ten-character field used to group items by classification. It simply provides you with another means of classifying, sorting, and reporting your inventory.

> The system offers attractive inventory item pricing alternatives.

Also on Figure 1, you will notice three commission fields (type, rate, and percent). Consistent with its retail/wholesale trade orientation, the system will compute and report sales commissions (if based on the sale of an item) as a percentage of the item's price, a percentage of the item's cost, a percentage of the profit made from the sale of the item, a set dollar amount, a set dollar amount plus any of the percentages noted above, or it will report that no commission at all was earned.

Running Promotions and Sales

Figure 2 contains several fields titled Promotions and Sales. Sales promotions are a basic tool used by retailers and wholesalers to stimulate sales. The manner in which promotions—especially price promotions—are carried out can affect your computer system requirements, and few microcomputer-based inventory systems address these needs.

Setting up an item for a price promotion is easy with *Inventory*. The Name of your particular promotional event can be entered using a description of up to seven characters. The promotion period can be entered in the form of a Starting Date and Ending Date. And, finally, a Discount Type and Amount can be established and used to calculate and display the promotional price of an item during point-of-sale

```
INVENTORY MAINTENANCE                    - INV.1.2.A -          Number active:   40
CHANGE ITEM                                                     Number unused:   10
    *1. Item number      MAX-PC
     2. Description                                  ---- Taxable ----
        128K Computer - Maxcell                      11. Sales Tax # 1     No
     3. Item type        Sales Inventory             12. Sales Tax # 2     Yes
     4. Re-order number  1039                        13. Sales Tax # 3     No
     5. Vendor number    MAXCELL
                                                     14. Ship weight        20.0
     6. Prod. Category   COM                         15. Back Order        Yes
     7. Generic descr    COMPUTER                    16. Ship by U.P.S.    Yes
     8. Substitute # 1   1033                        17. Commission type   Percent Price
        128K Computer - Bayshore                     18. Commission rate              .00
                                                     19. Commission pct.    7.5
     9. Substitute # 2   1036                        20. Inventory acct.   1  HARDWARE
        128K Computer - Canyon                       21. Retain History    Yes
                                                     22. Avg Lead Time      16.0
    10. Serial numbers   Yes                         23. # of Invoices        1

---------------------------------------------------------------------------------

Any Change ? No
```

Figure 1: *The first Inventory Maintenance screen. 1. The item number can be up to 15 characters, descriptions up to 30 characters. 2. This entry indicates that you have allocated enough disk file space for 50 inventory items. 3. A "yes" answer here indicates that you want the system to allow you to backorder. 4. "Yes" here will cause the system to request product serial number information. 5. This identifies the inventory financial account code used to summarize the financial impact of inventory transactions. 6. Responding "yes" will cause the system to accumulate information on the quantity sold, total sales, total cost of sales, and quantity sold last year for this item. 7. This item is automatically calculated each time inventory is received.*

transactions. The discount can be in the form of a dollar amount or a percentage. A Promotion Sales Report, listing all items on promotion, is available to monitor the effectiveness of your promotion for a particular item.

What GPS calls "User Categories" can also be found in Figure 2. The system allows you to define up to six user-defined data fields to be associated with each of your inventory items. This allows your inventory file to maintain information that is unique to your business and lets you produce inventory reports sorted by these user-defined data fields.

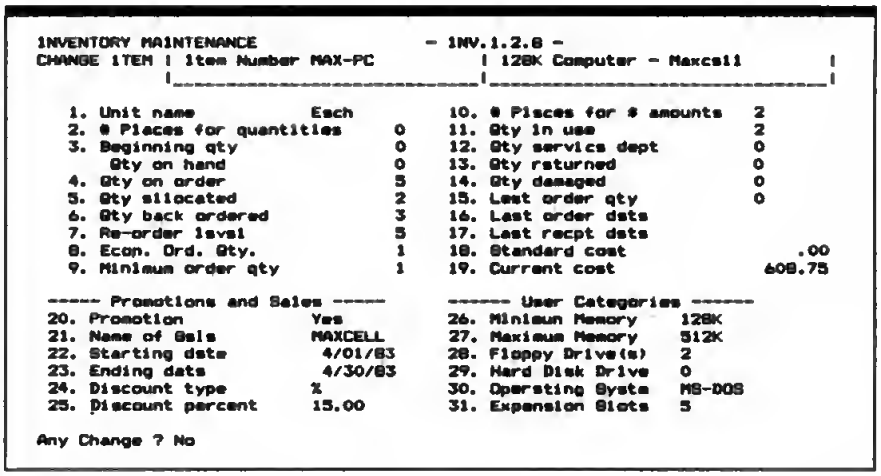


Figure 2: *Inventary screen shawing promatians and sales. 1. The Unit Name can cantain up ta eight characters. Quantities con contoin zero, ane, ar two decimal places. 2. The system outomaticolly decreases this field ta reflect the number af items received. You must manuolly update it ta reflect new purchase orders. 3. These fields report those items not ovoiloble far sale. 4. The Purchasing Advice Report lists all items less than ar equal ta the "re-order level," suggests quantity ta re-order based an the "economic arder quantity," and states the "minimum order quantity" far each vendor. 5. These fields are outomaticolly updated.*

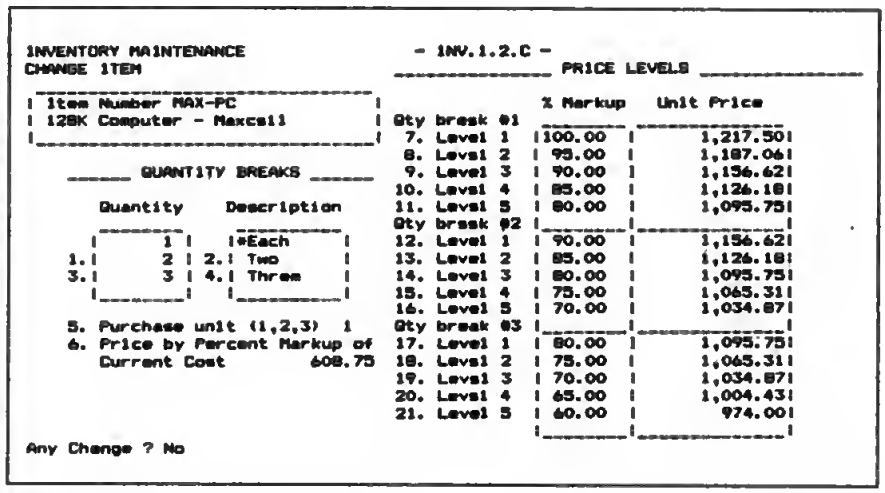


Figure 3: 1. *The Description is ossumed to be the Unit Nome. 2. The first description for the quantity discaunt breaks is a default fram the Unit Name field. Retoil customers might be assigned one price level and wholesalers anather. 3. For eoch quantity, you can establish up to five price levels.*

Pricing Your Merchandise

The system offers attractive inventory item pricing alternatives (see Figure 3). When setting up an inventory item, you must decide how you want to price the item. You can price items based on a combination of quantity-discount price breaks and customer price levels (for preferred or different types of customers). You must also select a method to calculate the price of the item. If you assign different prices for the same item to the three available quantity-discount breaks, item purchases meeting the quantity break limitations are automatically given the correct price in point-of-sale transactions.

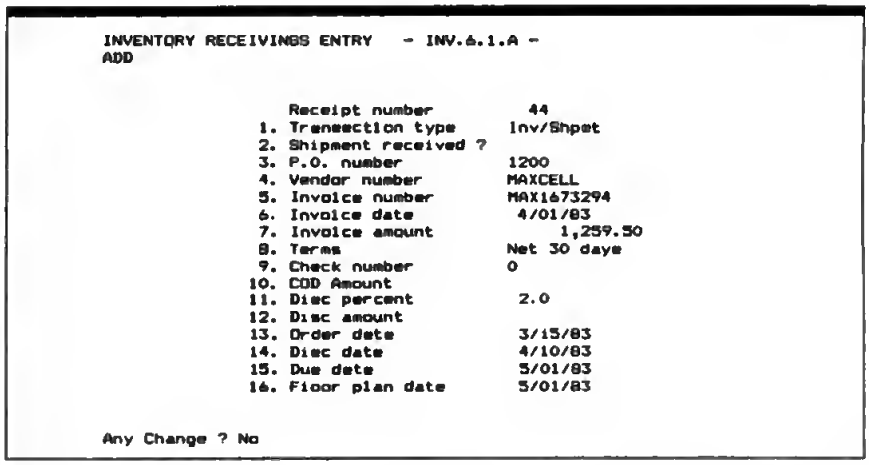
When the system is used with *Accounts Receivable*, you can define five levels of pricing *per* quantity discount break. Each customer is then assigned a price level for each of the three quantity discounts. This offers you 15 prices per item. Again, the price used during a point-of-sale transaction will be a function of the quantity purchased and the purchasing customer's assigned price level.

The actual prices set for each customer price level are also a function of the four methods the system can use to compute the price of an item. A Dollar Amount, for example $100, can be entered and will be used as the actual selling price. A Percentage of List Price can be used to calculate the selling price by multiplying the list price by the percent entered (including percentages greater than 100 percent). For example, entering 90 percent along with the $100 entered above would give a price of $90. A Markup Percent can be taken as a percentage of the current cost, and this percentage will be added to the current cost to get the selling price. Entering 20 percent in this case would result in a price of $120. Finally, a Percent of Margin can be input to determine the item's gross profit based on its final sales price. Entering 20 percent here results in a price of $125. As you can see, the system provides a great deal of pricing flexibility.

Receiving Your Goods

Receiving merchandise with the GPS system is relatively straightforward. Figure 4 shows the first of two screens used to enter inventory receipts. The system documentation discusses how to handle the recording of transactions in which you receive a shipment prior to the associated invoice, receive an invoice prior to the associated shipment, or receive the merchandise and the invoice together. Unfortunately, many distribution businesses receive merchandise (and must record the receipt of these goods) prior to receiving the associated invoice. Again, because many distributors use a perpetually calculated moving-average cost to value their inventories, they must make an estimate of the "landed" cost when they enter a receiving. The GPS software provides you with a good deal of flexibility in this regard, but users must control, administratively, how certain of these transactions are entered. The accounting can get "hairy" if you choose to receive merchandise at a zero (or some otherwise inaccurate) cost and then sell a portion of this stock prior to your recording the associated invoice.

You can choose to value your inventories using LIFO, FIFO, Weighted Average, or Standard Cost. If you choose LIFO or FIFO, you can specify that it be calculated on a perpetual or a periodic basis.



```
INVENTORY RECEIVINGS ENTRY   - INV.6.1.A -
ADD

                    Receipt number          44
                 1. Transaction type      Inv/Shpmt
                 2. Shipment received ?
                 3. P.O. number           1200
                 4. Vendor number         MAXCELL
                 5. Invoice number        MAX1673294
                 6. Invoice date           4/01/83
                 7. Invoice amount             1,259.50
                 8. Terms                 Net 30 days
                 9. Check number          0
                10. COD Amount
                11. Disc percent           2.0
                12. Disc amount
                13. Order date             3/15/83
                14. Disc date              4/10/83
                15. Due date               5/01/83
                16. Floor plan date        5/01/83

Any Change ? No
```

Figure 4: 1. *This title can be used to locate instructions in the documentation.* 2. *The last vendor number/name is automatically displayed.* 3. *When integrated with Accounts Payable, the vendor terms can be displayed here.* 4. *The Order date field calculates the average lead time for an item.*

```
POINT OF SALE          - INV.8.1.A -    Sales Slip # 1006     Sls person JONES01

   Name Robert Smith                      SHIP TO:
   Adr1 Data Processing Manager              Name Robert Smith
   Adr2 P.O. Box 1560                        Adr1 Gold River Plaza Building
   City Sacramento        St CA              Adr2 537 Gold River Run
   Zip  95814-1560                           Adr3 Sacramento      , CA 95810

 #  Quantity  Item Number     Description                    Price     Extension
 1 1.......   MAX-PC          128K Computer - Maxce

   ------------------------------------------------------      Total          .00
 Price Breaks                                        *** MAXCELL PROMOTION ***
        1-        1/     1,217.50          Suggested Price          1,217.50
        2-        2/     1,156.62          Discount                    15.00%
        3- UP      /     1,095.75          Promotion Price          1,034.87
```

Figure 5: 1. *If integrated with the Payroll System, the Salesperson number can be linked to an Employee number.* 2. *Based on the sales quantities entered, a quantity discount description and sales price will be displayed.* 3. *Promotional information is displayed here including the suggested price and the discount.*

Floor Planning

The use of "floor-plan" or "flooring" inventory financing arrangements is common to retail operations marketing "high-ticket" items. Floor planning is an inventory financing agreement with a supplier (or other third-party creditor) that provides for payment of inventory items upon their sale or the expiration of a set period of time, whichever comes first. Because the amount financed at any given time is a function of the actual, "identifiable," items in inventory, it is common that goods financed in this manner be tracked by serial number. As you might imagine, this can present a recordkeeping nightmare for high-volume businesses.

The developers of the GPS *Inventory* system sought to ease this burden by helping you track and report your inventory items by serial number. The system facilitates your use of floor-planning agreements through the use of a "floor-plan date" (see Figure 4). The floor-plan date is tied to the serial numbers of the items you receive. To effectively manage your financing of this merchandise, the system provides you with a serial-number aging report. This report can be used to determine the number of days of "free" financing remaining for each item, along with the number of days each serial-numbered item has been in stock.

While these features are quite helpful, GPS could have gone a step further. Many retailers use more than one creditor to floor their goods, but the system provides no means to identify the flooring company for each item. A list reporting the status of all floored items—including those that

have been sold—would also have been useful. This kind of report could summarize, at a moment's notice, the amount financed, the amount owed, and the amount due *now* to each of the flooring creditors.

Point-of-Sale Routines

Clearly, the most unique feature of the GPS *Inventory* system is its point-of-sale orientation that assists you in accounting for over-the-counter sales activities. The requirements placed upon a system in this environment are, indeed, demanding. Response times must be immediate, and nothing (but *nothing*) should cause significant delays in processing sales-counter transactions.

Using the screens shown in Figures 5 and 6, salespeople merely enter customer, merchandise, payment, and tax data. (Of course, serial numbers also have to be entered if you're using them.) The pricing of your merchandise (promotional pricing as well as quantity-discount price breaks) is handled automatically, along with the printing of a sales slip showing all sales/payment information.

To accommodate the point-of-sale process as far as possible, GPS has developed a means of having the computer automatically open the cash drawer for you. With this system, you physically connect a cash drawer to your PC via a serial or parallel port. GPS claims that any cash drawer "with electronic pulse" will work. Once connected, your PC functions like a cash register, handling transactions such as cash sales, account sales, returns, and quotes (which are assigned a sales slip number so you may recall them at any time for reference or to be converted to an actual sale).

> Nothing (but nothing) should cause significant delays in processing sales-counter transactions.

The system also recommends the oldest/newest serial-numbered item for sale (depending on your inventory valuation method) and suggests user-defined substitutions for out-of-stock items. However, the system is only capable of printing multiple invoices (sales slips), more commonly known as batch invoice processing. This limitation could present a problem for wholesale operations.

Using other parts of the Great Plains *Hardisk Accounting Series*, in conjunction with *Inventory* adds additional capabilities:

- When processing inventory receipts, the *Inventory* system can automatically enter the purchase cost of the items received into the *Accounts Payable* system;
- Customer charge sales can be automatically forwarded to the appropriate customer account in the *Accounts Receivable* system;
- Commissions payable to salespeople can be passed to the appropriate employee's record in the *Payroll* system. If merchandise is returned by the customer and the commissioned salesperson number is entered, the payroll records can be adjusted accordingly.

Inventory and Sales Reporting

The *Inventory* system uses an impressive array of reports for inventory valuation, sales history, and audit trail purposes. The Inventory Turnover Report calculates a physical turnover rate for each item in stock, figured as follows:

$$\frac{\text{Quantity sold year-to-date}}{\text{Average monthly inventory}}$$

Turning inventory is what the distribution business is all about. When properly used, this report can help you monitor your inventory activity. Excessive inventory can result in unexpected losses due to depreciation, obsolescence, changes in demand, and financing costs. Carefully monitoring the inventory turnover rate of important items will assist you in planning future purchases, controlling costs, and planning future sales promotions.

The system also provides other reports summarizing important categories of information. For example, the Inventory Item List provides detailed information on each item. Ordering and shipping detail, and price and cost information is supplied. In addition, a Price List details each customer's established price level. Quantity-

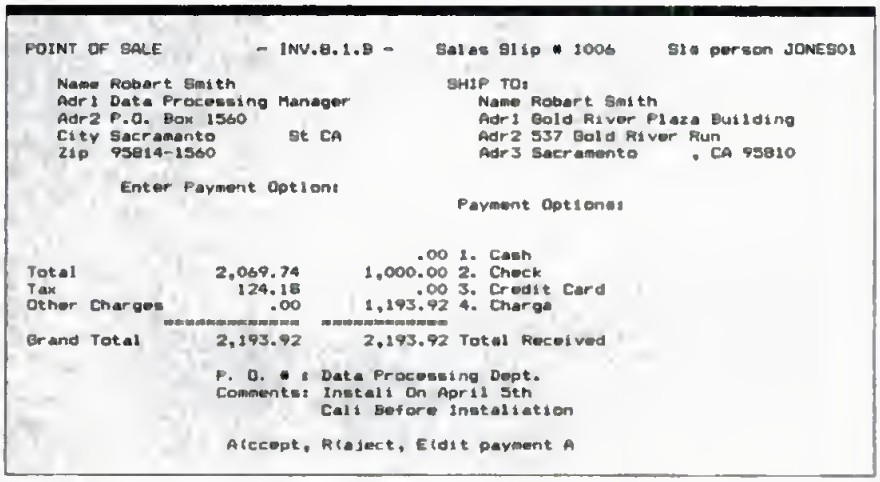
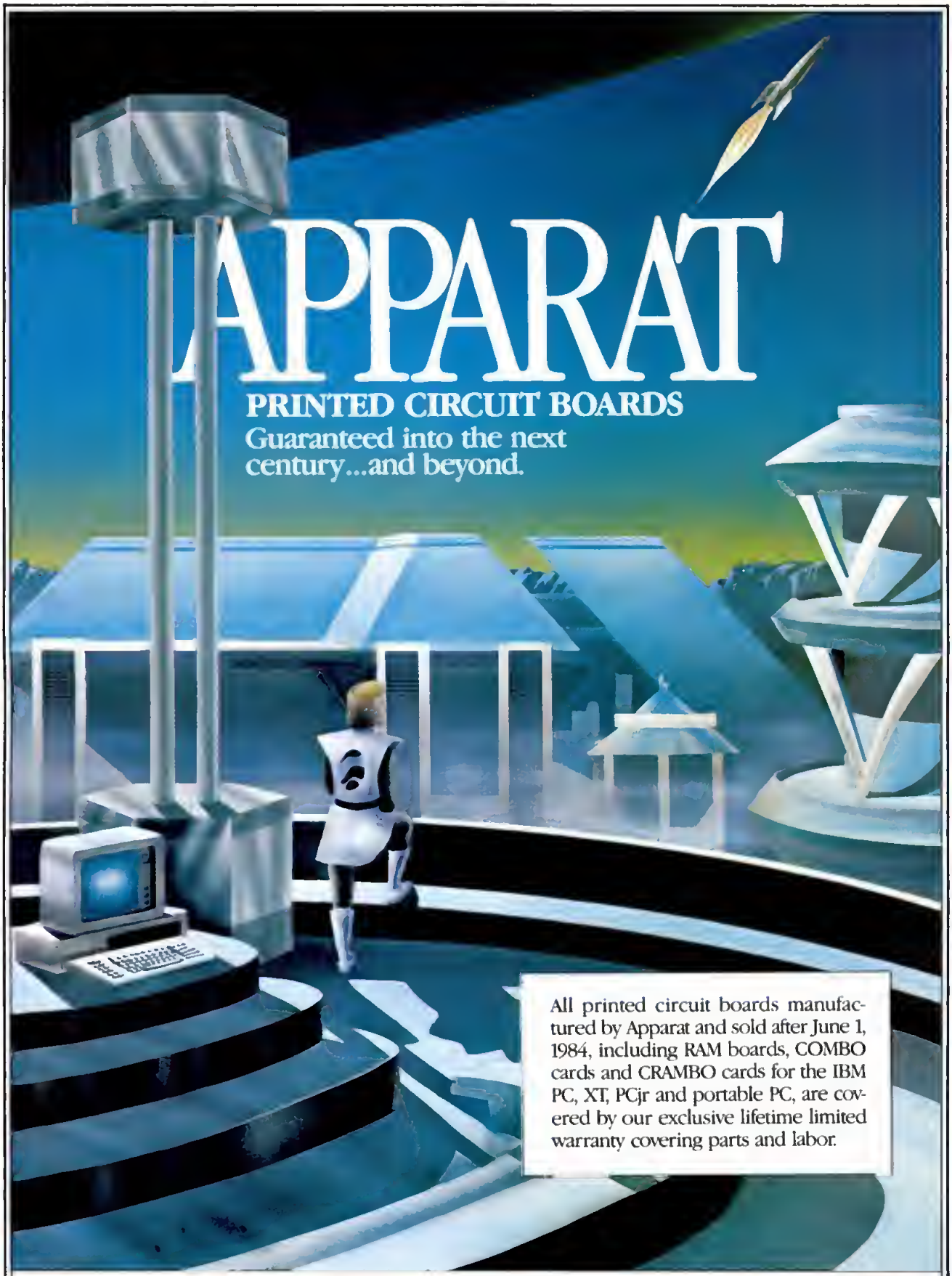


Figure 6: 1. *Three different types of taxes can be computed for each item.* 2. *The multiple payment option may be specified as customer purchases are entered.* 3. *Two "Comment" lines of up to 30 characters each can be printed on the sales slip.*



4401 South Tamarac Parkway, Denver, CO 80237—Customer Service 303/741-1778

Apparat retail outlets—DENVER: 4401 S. Tamarac Pkwy. 303/771-2032 • 5224 W. Warren Ave. 303/985-1217

CHICAGO: 1844 S. Arlington Heights Rd. 312/640-0322

Imagine your PC with Apparat add-ons. Imagine where it could take you.

Special values from the hard disk experts. For example, imagine your IBM PC or Portable PC with hard disk capability. Apparat's external Hard Disk Subsystem is completely compatible, running DOS 2.0 or 2.1 without modification or device drivers. And now you can get more capacity—22 and 33 MB formatted configurations—for less money. 22 MB for **$2,295,** 33 MB for **$2,995.** Apparat also offers internal or external 10 MB drives at similarly low prices.

XT owners—trade in your 10 MB drive for a larger Apparat hard disk drive. Our 22 MB drive is **$1,299,** but you pay just **$899** with a trade-in of your existing 10 MB drive. Our 33 MB drive is just **$1,799,** but you pay just **$1,399** when you trade in your existing 10 MB drive. Call the Apparat ordering hotline for trade-in details and shipping instructions.

TEAC or Panasonic floppies. These half-height floppies are perfect for your PC, PPC, or XT. Call for trade-in prices on full-height floppies.

New 28 pin EPROM programmer. Now Apparat has a new Prom Blaster for the PC, XT, PPC and PCjr to program most 28 pin EPROMS (including the 2764, 128, 256), in addition to our original Prom Blaster that programs most 24 pin EPROMS .. each **$129.** We also make an EPROM cartridge for the PCjr to accept your newly programmed EPROMS.

PPC and PCjr. Apparat has developed new products for the IBM Portable PC. Now available is a 256K RAM card and a Combo card (P & S). Both fit the PPC short slots. New for the PCjr is a 128K RAM card and a Combo jr card (P & clk). Both fit the side attachment.

Other Apparat add-ons. RAM cards for the PC and XT—64K **$189,** expandable to 512K. COMBO II card for the PC and XT, 5 functions on one card—**$189.** CRAMBO card for the PC piggybacks COMBO II on 64K RAM card—**$359.** 64K internal PRINT SPOOLER with parallel interface— **$299.** Stand-alone at **$319.**

Warranty. All Apparat manufactured P.C. boards sold after June 1, 1984 covered by our exclusive lifetime limited warranty covering parts and labor.

Apparat, Inc.

ADD ON AND ON AND ON AND ON AND ON

ORDERING AND DEALER INFORMATION

800/525-7674

Prices subject to change without notice.

CIRCLE 174 ON READER SERVICE CARD

INVENTORY CONTROL

status information can be found in the Inventory Stock Status Report, which provides data on each of your items (stock on hand, on order, and back-ordered) as well as your current and actual cost, and total inventory value. Finally, a Sales Analysis by Product Category can be prepared and sorted by either the vendor or product category. This report can list either detail or summary information with month-to-date or year-to-date totals.

Other reports include a Purchasing Advice Report (items that are at or below their reorder level), Purchase Receipts Report (with month-to-date receipts in detail or summary), Serial Number Aging Report (showing days in possession by serial number), a Quotes History Report, an On-order Report, a Backorder Report, an Inventory Receiving Edit List, an Inventory Receiving Journal, a Detailed Sales History Report (sales slip detail), a Detailed Sales Report, and a Sales Commissions Due Report.

The GPS software provides for data security through a system of four-character security passwords. These can restrict access to the entire GPS accounting series, the individual systems, or particular programs within each system.

Set-up, Maintenance, and Documentation

Setting up the system is not difficult. (If you have never worked with a system using the UCSD p-System, a few terms may be foreign to you.) You first need to estimate your inventory activity and set aside an appropriate amount of space for your inventory files. (The system theoretically accommodates 32,000 items, but GPS recommends using no more than 6,000 items.) This way, a host of company data can be input to meet your individual needs, including your company's name and address, password security codes, printer control codes, and so on. The administrative routines supplied with the system include utilities to back up and restore your data files.

While the system installation procedures are simple enough, they have one major shortcoming. They are designed to be loaded into what is termed the "root" (or main) directory of your hard disk, leaving you with an inability to process transactions for more than one company. Someone well-versed in disk procedures and UCSD Pascal utility commands could provide multiple-company capability by manipulating the placement of your files on the hard disk. This is accomplished by manually setting up your separate (or multiple) companies on the hard disk in a subdirectory and will allow you to set up as many companies as you need, depending on the amount of disk space available.

Professionally packaged documentation (in gray pinstripe, no less) is provided with the system. Each chapter is straightforward and easy to follow, except for some of the data-input field explanations. The authors supply an explanation for each input field, but their explanation is not always clear enough to spell out the use and impact of each of the data fields. The documentation assumes that you have a basic understanding of accounting principles and that you have read the computer, hard disk, and printer manuals.

GPS maintains an ongoing policy of providing direct telephone support to end users at no charge. A toll-free telephone number is provided and support representatives are available to answer any questions you might have. The company's response to our questions was adequate.

Summary

With its unique point-of-sale orientation, the GPS *Inventory* system should be a candidate for retailers considering the use of a PC in an over-the-counter sales environment. Remember, selecting a software package for your business is a matter of comparing your specific needs with the specific features of the packages available. For retailers and wholesalers with retail or retaillike operations, this system should be on the list of packages to evaluate. Demonstration packages are available from GPS for $25.—**G. William Dauphinais**

NewWord: A WordStar Double At Less than Half the Price

NewWord's manufacturers plan to give MicroPro a run for its money with this budget-priced clone of the ever-popular WordStar. Here's how the new kid on the block stacks up.

NewWord is challenging *WordStar* head on. This *WordStar* clone, marketed by Rocky Mountain Software Systems, is featured in an ad that shows an old-fashioned balance scale—the kind that the blindfolded Grecian figure called "Justice" usually holds. One balance pan contains a tall stack of dollar bills labeled "*WordStar MailMerge* $645". In the other pan is a shorter stack labeled "*NewWord MergePrint* $249." The caption proclaims: "When it comes to the two best word processors, it's a question of weighing the differences." The implication is that *NewWord* has the power of MicroPro's *WordStar*/*MailMerge* combo at less than half the price.

Can margarine really taste just like the high-priced spread? In this case, surprisingly enough, the taste is quite similar. *NewWord* comes close to its renowned competitor—although the discriminating palate will still sense the difference.

NewWord is the result of the efforts of three former MicroPro employees, Stan Reynolds, Peter Mierau, and Richard Post, who left in November 1982 to form a company called NewStar. The trio decided to produce *NewWord* because, according to Reynolds, "We thought we could do a better job."

NewStar has been selling a CP/M version of *NewWord* since last October, and it began to market the IBM PC version in March. NewStar isn't afraid of a lawsuit from MicroPro, Reynolds says, because although *NewWord* is a *WordStar* lookalike, the program code is original. He adds that MicroPro has had an evaluation copy of *NewWord* since last November, "and if the company were going to move it would have done so by now."

Although the folks at MicroPro aren't talking, I'll bet they did a double take the first time they saw *NewWord*.

A WordStar Clone

NewWord looks so much like *WordStar* that it could almost be a different release of the same program. It has *WordStar*'s menu structure and most of the same commands. Like *WordStar*, it greets you with an opening menu (see Figure 1) that leads you into its main functions. Most of the time you will choose D to retrieve a document from disk or to create a new document. In *WordStar*/*NewWord* terminology, a *document* is a text file upon which the program can perform its word processing magic. If you look at a *NewWord* document with the DOS TYPE command, you'll see bits of ordinary-looking text interspersed with strange

Illustration: Reynold Ruffins

hieroglyphics. Both programs understand these codes, so *NewWord* and *WordStar* can read each other's documents.

If you want to use *NewWord* as a program editor or to write DOS batch files, you'll have to choose N for nondocument. This unhappy choice of terminology, also inherited from *WordStar*, simply means that *NewWord* will forgo the hieroglyphics and store your text as a straightforward ASCII file, which can be easily understood by compilers or other programs that need ASCII input. When you use this nondocument mode, you lose word wrap and have to end each line with a carriage return as if you were using a typewriter. You also lose a number of other editing features, including automatic centering, the ability to set tabs and line spacing, and right justification.

Once you start writing either a document or a nondocument, you choose program options by pressing the Ctrl key in combination with a letter. Ctrl pressed with Y (Ctrl-Y) deletes a line, Ctrl-T deletes a word, and Ctrl-B realigns a paragraph. Some control keys take you to auxiliary menus that lead you into other program options. For example, Ctrl-K brings you the Blocking and Saving menu (see Figure 2) and Ctrl-Q brings you the Quick menu (see Figure 3).

When you're ready to print, you can control print formats like page length, margin size, and spacing by placing dot commands next to the left margin of your text. For example, the command .LS2 tells *NewWord* to double space your text. As in MicroPro's *MailMerge* program, dot commands also let you create personalized form letters by inserting the correct name and address into each letter.

```
                    O P E N I N G   M E N U

D get a document to change,          L change logged disk drive
  create a new document              E rename a document
N create or change non-document      O copy a document
P print a document                   V delete a document
M merge print a document             F turn directory off
C protect a document                 J help
X all done with NewWord (exit)
```

Figure 1: *Like* WordStar, NewWord *greets you with an opening menu.*

```
                B L O C K I N G   &   S A V I N G   M E N U

   SAVING                      BLOCKING                  DOCUMENT
S save & resume edit      B mark start    C copy      O copy
D save document           K mark end      V move      J erase
X save & exit NewWord     H hide/show     Y delete    L change logged drive
Q quit without saving     W store to disk             R insert a document
                                                        from disk
```

Figure 2: NewWord*'s Blocking and Saving menu is entered by pressing Ctrl-K.*

NewWord has reproduced the *WordStar/MailMerge* command structure almost in its entirety. Of 143 *WordStar* editing and print control commands, *NewWord* uses 121 to control identical functions. What about the other 22 commands? *NewWord* doesn't offer comparable features for 18 *WordStar* commands.

In four instances *NewWord* uses a different command to invoke a *WordStar*-like feature. In the opening menu, *NewWord* uses J to call the Help menu while *WordStar* uses H. By my calculations, *NewWord* has 87 percent of the power of *WordStar/MailMerge*. Now, 87 percent of the power at less than half the price isn't a bad deal, especially if none of the missing features are on your "must have" list.

However, such an index is at best an approximation of the similarity of the two programs. There are differences that are harder to quantify. For instance, the two programs operate at different speeds. *WordStar* Version 3.3 scrolls to a new screen in less than a second, while *NewWord* takes almost 3 seconds to rewrite a new screen. *NewWord* makes up for some of this lost speed by not pausing to read from disk as often as *WordStar* does, so while *WordStar* will make your disk drives grind when you change help levels, delete a line, or pull in a menu, *NewWord* does the same thing more quickly with program code that's already in memory.

There are other differences, too. *WordStar* can run on a PC equipped with 64K

PC FACTOR

NewWord, Version 1.29
Rocky Mountain Software Systems
P.O. Box 3282
Walnut Creek, CA 94598
(415) 680-8378
List Price: $249
Requires: 96K RAM, PC-DOS, one disk drive.

CIRCLE 800 ON READER SERVICE CARD

RAM, while *NewWord* requires 96K. Both programs use spill files on disk to hold sections of long documents that don't fit into RAM, but *NewWord* can hold up to 15 pags of text in internal memory while *WordStar* holds only 7. That means *WordStar* has to read from the disk more often when you're editing a large document.

And unlike *WordStar*, *NewWord* comes with a kind of "piracy protection." This isn't copy protection in the usual sense; you can make as many backup copies of your *NewWord* disk as you like. But before you can run the program, you have to call Rocky Mountain Software to learn the special code that will "unlock" your disk. This procedure also causes your name to appear on the program's opening menu, which may embarrass those who try to use pirated copies.

There are areas in which *NewWord* actually goes *WordStar* one better. For starters, *NewWord* has an "undo" key. If you've ever accidentally deleted sentences or even entire paragraphs, you'll appreciate this feature. By pressing Ctrl-U, you can recover the last thing you deleted. *NewWord* has a buffer in which it temporarily stores all deleted text. If you don't mind living dangerously, you can cut and paste from one section of your text to another by deleting and then recovering. *NewWord* comes with a buffer that will hold up to 100 characters, but you can increase the buffer size with *NewWord*'s installation program. I used *NewWord* with a 10,000-character buffer that rescued me from the inadvertent deletion of several pages.

Another plus for *NewWord* is its simple installation program and related utilities. You can bypass complicated options, such as deciding on the size of the delete buffer, until you know more about *NewWord*. Later, you can run the installation program again and make such decisions as how many menus will appear on the screen, whether text will be right justified, and whether *NewWord* will create an automatic backup whenever you save a file.

NewWord provides two handy utility

```
                    Q U I C K   M E N U

                  SCROLLING

  CURSOR        R top of document     FINDING          OTHER
E upper left    C bottom              F find           B align paragraphs
X lower right                         A find & replace
S left end        ERASING             P find a page
D right end     Y line to right         (line if nondoc)
              DEL line to left
```

Figure 3: *The Quick menu is entered by pressing Ctrl-Q.*

programs, NWKEY and NWCOLOR. NWKEY lets you assign *NewWord* commands to the PC's function keys, both unshifted and in combination with Ctrl, Shift, and Alt, giving you a total of 40 function keys. In contrast, *WordStar* 3.3 only allows you to define the ten unshifted function keys. NWCOLOR lets you decide what colors to work with on a color monitor, or the intensity of your characters on a monochrome display.

Color and intensity take on a bit more importance in *NewWord* than in *WordStar*, because *NewWord* tries to give you something extra in the what-you-see-is-what-you-get department. If you want a phrase to appear in boldface (Ctrl-PB), *NewWord* can display the phrase in high intensity video or in any of the PC's colors. You can also choose the color or intensity for normal text, strikeouts, underlined text, subscripts, superscripts, and doublestrikes.

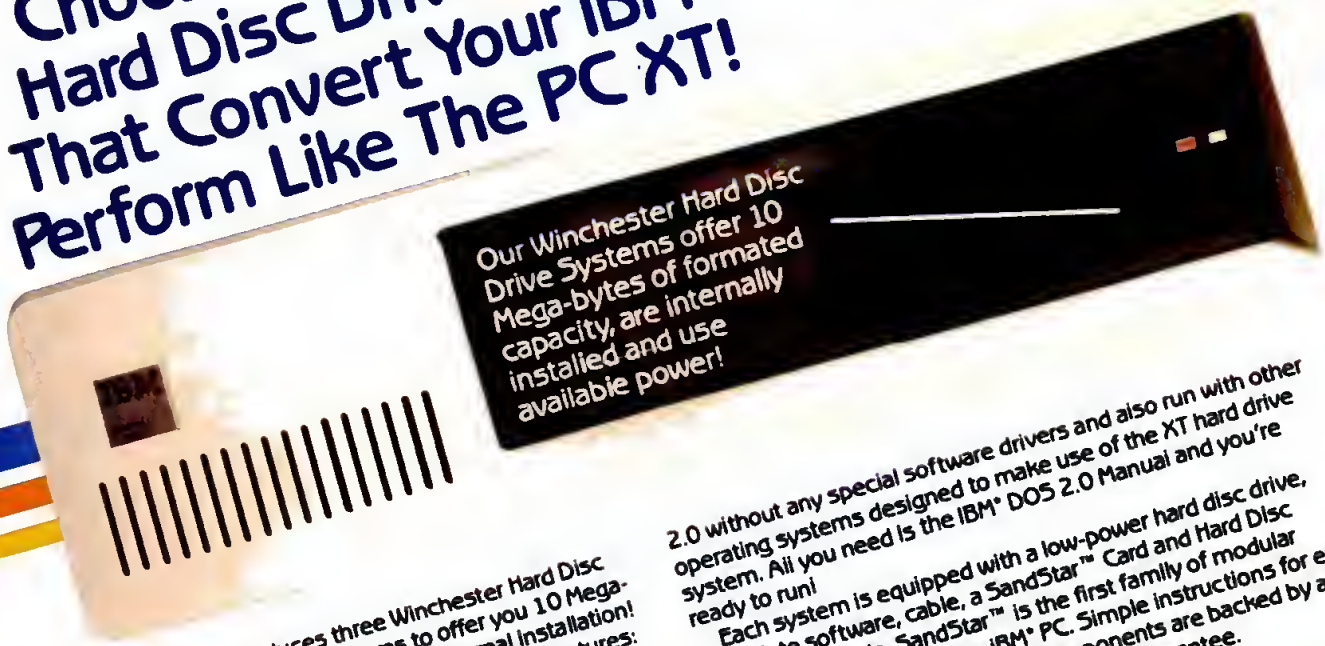
In the realm of print formatting, *NewWord* has improved on *WordStar* by permitting headers and footers with multiple lines. It has a nifty new dot command, .RR, which inserts new margins and tab settings into the text. *NewWord*'s editor recognizes the .RR command, so you can include up to seven different ruler lines in your document without having to change margins with the Ctrl-OF command.

NewWord also has some extras for people who use dot matrix printers. I tested it with my Epson MX-100 printer and found to my surprise that my printer was able to produce a kind of microjustified text. I'd always thought that microjustification, the insertion of "microspaces" between letters to create a straight right margin, was strictly the province of high-priced letter quality printers. But *NewWord* gives us dot matrix printer owners a kind of poor man's microjustification. As opposed to the high-priced version in which the printer randomly inserts 1/120-inch slivers of space between letters, the dot matrix printer version inserts larger microspaces, 1/60 of an inch wide, between words. Without microjustification, when you print right-justified text, the printer will insert two full spaces between some words and only one space in between others.

Unfortunately, this feature is exceedingly slow. A line of type that my Epson normally prints in about 1.5 seconds takes 20 seconds with *NewWord*'s microjustification. But you can turn the microjustification on and off with a dot command, and you can run *NewWord*'s install program to keep it off unless specifically requested. It's there when you want it, but it doesn't need to bother you if you'd rather do without it.

Dot matrix printer owners will also be happy to discover that they can invoke built-in fonts such as condensed type or double-width type using *NewWord*'s character-width dot command. In *WordStar* this command, .CW, simply controls the spacing between letters. In *NewWord* it

NOW! Choose From 3 Hard Disc Drive Systems That Convert Your IBM* PC To Perform Like The PC XT!



Maynard Electronics introduces three Winchester Hard Disc Drive Systems — the only drive systems to offer you 10 Mega-bytes of formatted capacity with complete internal installation! These systems offer the user countless benefits and features: capability of booting off the hard disc; additional functions while requiring only one card slot in your PC; and, use of available power, thereby preventing overheating problems which have affected other drives. Handling heavyweight data was never easier.

All three systems are quality engineered and work with DOS 2.0 without any special software drivers and also run with other operating systems designed to make use of the XT hard drive system. All you need is the IBM* DOS 2.0 Manual and you're ready to run!

Each system is equipped with a low-power hard disc drive, complete software, cable, a SandStar™ Card and Hard Disc Controller Module. SandStar™ is the first family of modular peripherals created for the IBM* PC. Simple instructions for easy installation are included and all components are backed by an Unconditional One Year Parts and Labor Guarantee.

WS 1

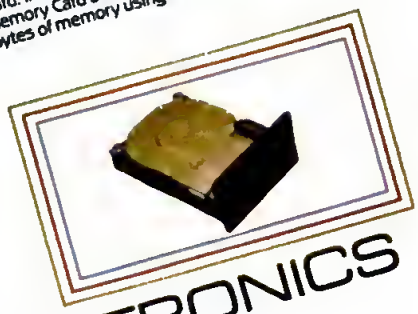
This System is equipped with the SandStar™ Multi-function card. In addition to the Hard Disc Controller Module, you can add up to three other SandStar™ modules while using only one card slot. The following modules are available: Serial Port, Parallel Port, Clock Calendar, Game Adaptor, and Prototyping Module

WS 2

This System is equipped with the SandStar™ Floppy Drive Controller Card. The Card can control, in addition to the Hard Disc Drive, two floppy drives mounted inside your PC and optionally two additional 5¼" or 8" drives mounted externally. This leaves three system slots for other expansion boards.

WS 3

This System is equipped with the SandStar™ Memory Card. In addition to controlling the Hard Disc Drive, the Memory Card allows you to add 64K bytes to 576K bytes of memory using only one card slot.



To expand your PC to perform like the PC XT, one of our Winchester Hard Disc Drive Systems is right for you. And if you have already made the wise decision to install any of Maynard's SandStar™ Cards, the SandStar™ Hard Disc Controller Module may be purchased separately.

TO ORDER, CONTACT YOUR LOCAL DEALER OR DISTRIBUTOR.

MAYNARD ELECTRONICS

400 East Semoran Blvd.
Casselberry, Florida 32707
305/331-6402

We make modem times better.

CIRCLE 437 ON READER SERVICE CARD

NOW! Compatible with COMPAQ!**

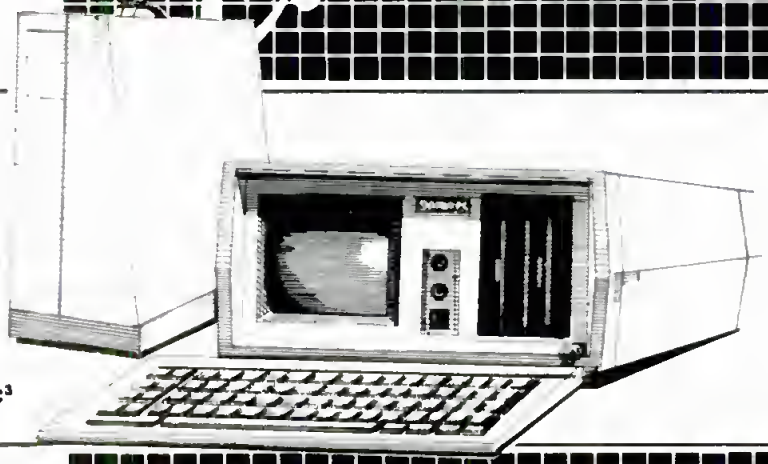
*IBM is a trademark of the International Business Machines Corporation.
**COMPAQ is a trademark of the COMPAQ Computer Corporation.

LOGIC Unlimited declares 1984 the year of the PORTABLE . . .

IBM Compatible

EAGLE Spirit-2

- Dual 360K Disk Drives
- 256K RAM
- High Resolution Graphics
- Complete with MS-DOS 2.0, GWBASIC (BASICA), *and* SuperCalc³



This is one of the most IBM compatible computers on the market today. We've never seen it at a better price. Act now!

$1984.00

Computers

SANYO:
- MBC-550 . . . . . $799
- MBC-555 999

SANYO OWNERS: Call for details on our double sided disk drive upgrade

EAGLE:
- Spirit XL 3875
  256K, SuperCalc³, Easy Writer 1, & Carrying Bag.
- PC Plus . . . . . CALL
- 1600 Series . . . . . CALL

COLUMBIA:
- All Models . . . . . CALL

TAVA:
- PC . . . . . CALL

TOSHIBA:
- T-100 . . . . . CALL

ALTOS/TELEVIDEO:
- All Models . . . . . CALL

Monitors

TAXAN:
- HiRes Green . . . . . $ 97
- HiRes Amber 107
- RGB 210 299
- RGB III 399
- RGB 420 (IBM) 425
- TTL/Green (IBM) 145
- TTL/Amber (IBM) 150

Printers

OKIDATA:
- ML 82A $299
- ML 92 419
- ML 93 825
- ML 84 760
- 2350/2410 . . . . . CALL

SPECIAL OKIDATA SALE!

STAR MICRONICS:
- Gemini 10X $269
- Gemini 15X 389
- Delta 10 399
- Delta 15 529
- Radix 10 649
- Radix 15 749

TOSHIBA:
- 1351 . . . . . $1295
- 1340 777

SILVER REED:
- EXP 400 . . . . . $299
- EXP 500 399
- EXP 550 499
- EXP 770 875

NEC:
- 3510 . . . . . CALL
- 3550 . . . . . CALL
- 2010 . . . . . CALL
- 2050 . . . . . CALL

Modems

HAYES:
- 1200 . . . . . $489
- 1200B 449
- 300 205

IBM Accessories

AST RESEARCH:
- All Products . . . . . CALL

HERCULES:
- Grephics Card $355

QUADRAM:
- Quedboard 64K $279

STB:
- All Products . . . . . CALL

Miscellaneous

CABLES:
- IBM Parallel $22
- Standerd Parallel 25

DISKETTES:
- 3M SS/DD/5¼ $21
- 3M DS/DD/5¼ 28
- BASF SS/DD/5¼ 19
- BASF DS/DD/5¼ 26

INNOVATIVE CONCEPTS:
- Flip N File 50 . . . . . $19

To Order

- **Pricing Policy:** Advertised prices reflect cash discount. Certified check or money order please. Company or personal checks allow two weeks for check to clear. Prices subject to change without notice.
- **COD Orders:** We will accept COD orders for up to $500. COD orders please add 2% to advertised prices.
- **Credit Card Orders:** We accept VISA and Mastercard. Credit card orders please add 3% to advertised prices.
- **Sales Tax:** Ohio residents add 5½% state sales tax.
- **Purchase Orders:** We will accept PO's from major Universities and Fortune 1000 companies. Terms net 30 days.
- **Shipping & Handling:** Please add 2% to total of all orders for shipping & handling ($2.50 minimum)

MasterCard VISA

USE YOUR CREDIT CARD!

TOLL-FREE ORDER LINE:

800/321-7492

IN OHIO CALL 216/746-0620

LOGIC automated

1323 Florencedale Avenue Youngstown, Ohio 44505 Technical Assistance/Order Status 216/746-0620

CIRCLE 130 ON READER SERVICE CARD

also controls the Epson's typefaces. The command .CW7 will give you condensed type; .CW12 gives normal type. You can also get intervening widths, although the printer will slow down quite a bit because it will use *NewWord*'s microjustification technique to space out the letters in a nonstandard way.

Inherited Failings

While *NewWord* is a powerful program with lots of features, it's not without problems. Because it so closely resembles *WordStar*, it has most of *WordStar*'s failings. Its complicated command structure is difficult to learn, although thousands of dedicated *WordStar* fans contend that once you learn it, it's easy to use. Although that might be a worthwhile trade-off for people who use the program every day, if you write only occasionally you'd probably be better off with a word processor that's easier to learn.

NewWord's manual does address this problem to some extent. Its well-written tutorial covers most of the program's features and compares favorably with some of the teach-yourself-*WordStar* books now on the market. The manual sometimes tries too hard to be cute; for example, when it discusses the creation of customized form letters it snickers, "Now that you have *NewWord*, you can misspell the names of thousands of innocent people, too." But it gets the job done, and too cute is better than too dull.

The manual has another, more serious defect. As was common 2 years ago when software publishers were racing to make their 8-bit programs run on the PC, *NewWord* does not come with a PC specific manual. Instead, the manual describes the CP/M version of *NewWord* and comes with a 23-page PC supplement entitled "Read Me First."

While this approach has advantages for manufacturers (they don't have to rewrite the manual), it takes its toll in confusion and frustration on the poor PC user. The manual describes program features that don't exist in the PC version while neglecting to explain some features that do. I spent quite a bit of time trying to figure out how to assign "user numbers" to my documents before I discovered that this feature is available only on the CP/M model. I also had a hard time getting one of *NewWord*'s custom fonts to invoke the italic font on my printer, because the manual lacked specific instructions. I finally succeeded after conferring by phone with a technical representative at Rocky Mountain Software and with Stan Reynolds at NewStar.

I also ran into the odd bug here and there. When I tried to get page numbers to print on the far left-hand side of a page using the .PC1 command, *NewWord* refused to print my text. More seriously, I found that whenever I tried to move or copy more than a screenful of text, *NewWord* garbled the result, placing some paragraphs in the wrong order and throwing others out of alignment. When I reported this problem to the folks at NewStar, they said they couldn't duplicate the bug on their equipment, but they offered to look at a copy of my file to try to determine what was wrong.

Support System

No program—especially a new program—is entirely bug-free, and that's why good support is an important part of a software purchase. Rocky Mountain Software offers free telephone support for the first 90 days after your purchase. If you want additional telephone support after that, you can pay an hourly rate of $45 per hour with 1-hour minimum units, or purchase a telephone support contract for $50 per month. If that's too high for you, you can still get answers to your questions by mail during the first year after your purchase.

Operation or Feature	*WordStar* Command	*NewWord* Command
Change logged disk drive	L	L
File directory ON/OFF	F	F
Set help level	H	J
Open a document file	D	D
Open a non-document file	N	N
Print a file	P	P
Go to Help menu	^J	^J
Insert carriage return	^N	Enter
Mark/unmark block beginning	^KB	^KB
Copy block	^KC	^KC
Subscript	^PV	^PV
Find and replace text	^QA	^QA
Line height	.LH	.LH
Output justification	.OJ	.OJ

This sampling of commands in *WordStar* and *NewWord* illustrates the similarities between the two programs' command structures.

All in all, *NewWord* stacks up well against *WordStar* and, by extension, with other top-of-the-line word processing programs. Alan Tan, director of marketing and communications for Rocky Mountain Software Systems, predicts that once the public discovers *NewWord*, the program will take most of the personal computer word processing market away from the long-reigning *WordStar*. That sounds as likely as the possibility that the Corona PC will steal the IBM PC's share of the personal computer market.

But like the Corona and other PC compatibles, *NewWord* will probably find a healthy market among budget-conscious consumers who want the power of a big name product without spending big bucks. ■

QUALITY

Integrated software for decision support and data processing

IT's the best. Rely on IT.

The IT series: integrated software that starts with KeepIT, for data base management, and interfaces to other PC-based software and the IT series programs.

The IT series advances the state of the art–to turn your desktop computer into a complete information center. From AskIT, an intelligent interface to KeepIT. To SwapIT, for memory partitioning and instant windowing.

For first-class results, try IT. You'll like IT.

KeepIT	StatIT	EditIT
CalcIT	LinkIT	SortIT
ShowIT	PassIT	AskIT
WritIT	MailIT	SwapIT

For IBM, IBM-compatible, and MS-DOS microcomputers

ITSoftware. . . ask for IT by name.

For more information, call toll-free (800) 222-0592. In New Jersey, call (609) 799-7500. Or write to us at ITSoftware, P.O. Box 2392, Princeton, New Jersey 08540.

We'll send you our free brochure.

NAME .....

COMPANY .....

TITLE .....

ADDRESS .....

CITY STATE ZIP .....

PHONE .....

PC4

MARTIN MARIETTA

Martin Marietta Data Systems

CIRCLE 432 ON READER SERVICE CARD

Tektronix 40XX Terminal Emulation

EMU-TEK™ IS NOW AVAILABLE FOR IBM PC, XT, AND MOST COMPATIBLES

- Access powerful mainframe graphics using:
  - —PLOT 10 (trademark of TEKTRONIX, Inc.)
  - —DISSPLA (registered trademark of ISSCO)
  - —SAS/GRAPH (trademark of SAS INSTITUTE, Inc.)
  - —DARC (available from QUESTEL, Inc.)
  - —and most similar packages and services.
- Upgrade from dim storage tubes to bright raster scan technology, with complete software compatibility.
- Increase versatility with options such as:
  - —High resolution board support (HERCULES, etc.)
  - —Local pen-plotter support (HP, AMDEK, etc.)
  - —Hard copy on EPSON or IBM matrix printer
  - —LIGHT PEN for graphic input
  - —Advanced communications program features
  - —Other terminal emulations, including:
    - —VT100 (trademark Digital Equipment Corp.)
    - —ADM3 (trademark Lear Seigler, Inc.)
    - —RETRO-GRAPHICS (trademark Digital Engineering, Inc.)
- **$395.00 PLUS OPTIONS**
- **30 DAY NO-RISK TRIAL PRIVILEGE.**

Call or write us, or see your participating dealer.

FTG DATA SYSTEMS
10801 Dale St./P.O. Box 615
Stanton, CA 90680
(714) 995-3900

FTG will soon become PC INNOVATIONS

THE LIGHT PEN FOR YOUR PC IS NOW EVEN BETTER!

- New photo-optical push-tip switch for super reliability.
- **30 DAY NO-RISK TRIAL PRIVILEGE,** and **TWO** year limited warranty.
- Ideal keyboard alternative for INTERACTIVE GRAPHICS, MENU SELECTION, EDUCATIONAL PROGRAMS, and just plain fun.
- Compatible with a growing library of software:
  - —PC-DRAW (trademark of MICROGRAFX)
  - —MICRO-CAD (trademark of COMPUTER AIDED DESIGN)
  - —SARGON 3.0 (trademark of HAYDEN PUBLISHING)
  - —and much much more. (Complete list on request).
- Very high performance and reliability for just $195.00. (Optional three diskette software package is just $39.00)
- Ultra-deluxe version soon available ($295.00).
- Got another pen?? Ask about our trade-in special.

FTG DATA SYSTEMS
10801 Dale St./P.O. Box 615
Stanton, CA 90680
(714) 995-3900

FTG will soon become PC INNOVATIONS

CIRCLE 250 ON READER SERVICE CARD

SPF/PC™

ACTUALLY, there is no comparison. SPF/PC is the best full-screen editor available for the IBM Personal Computer.

It looks and works like IBM's large system SPF editor.

- SPF/PC can use up to 786K of memory as workspace.
- Word processing commands.
- 4-way scrolling.
- Split screen support.
- On-line help facility.
- Can edit up to 240 character records.
- Monochrome or color supported.
- Instantaneous screen display.
- Block Move/Copy/Repeat/Delete/Overlay/Shift/Exclude
- Automatic line numbering supported.
- 40 user-definable Program Function Keys.
- Direct interface to DOS commands for PCDOS 2.0 users.
- Browse sub-system.
- Move/Copy sub-system copies any file format.
- Utilities include: Rename/Delete/Print/Directory list.

AND MUCH MORE . . .

UPLOAD/DOWNLOAD sub-system available to SPF/PC users for $50.00.

$149.95 SPF/PC requires 128K, PCDOS, and 1 disk drive.

THE ODD-COUPLE™

Allows the APPLE and IBM/PC to communicate with each other.

- Connect APPLE to PC, APPLE to APPLE, and PC to PC.
- Transfer any file in either direction.
- CHAT mode allows direct communications through the keyboard.
- An Equipment Profile allows description of your operating environment.
- Communicate Direct or through a Modem at speeds up to 9600 baud (bps).
- Written entirely in machine language for speed and efficiency.

REQUIREMENTS:
APPLE — 48K, 1 disk drive, Serial Interface
IBM — 64K, 1 disk drive, Serial Interface

$79.95

For orders and dealer information write or call Rogue River Software, 2822 Tahitian Ave., Medford, OR 97504, (503) 779-3002. Mastercard/Visa, Check, or P.O. accepted. Add $5.00 for shipping. Canada $10.00. Foreign $15.00.

IBM is a registered trademark of International Business Machines, Inc. APPLE is a registered trademark of Apple Computer Inc

CIRCLE 182 ON READER SERVICE CARD

FROM THE PUBLISHERS OF PC™

PC DISK MAGAZINE...The low-cost and efficient way to build a library of software programs!

These are some of the programs and applications you will have at your fingertips to expand your IBM PC:

Now you can build a library of software programs with amazing ease and at amazing savings! Imagine, adding to your home a library of utilities, sub-routines, games and data files for as little as $3 per program! PC DISK MAGAZINE, a new concept for your IBM PC gives you this and much more!

Every issue you get is a thoroughly tested, ready-to-run floppy disk with up to 8 programs, accompanied by a fully illustrated user manual.

ALL YOU HAVE TO DO IS INSERT THE FLOPPY DISK AND GO!

Subscribe today and save up to $60 for your order of PC DISK MAGAZINE! Send us the full payment by check, money order or credit card and *save on oddditionol 10%.*

ACT NOW...SAVE MONEY AND BEGIN YOUR SUBSCRIPTION TO *PC DISK MAGAZINE* TODAY!

Product Specifications:

- Programs will run on IBM PC, PC XT, PCjr. and most compatibles under PC-DOS and MS-DOS versions 1.1, 2.0, and 2.1, requiring a minimum of 64K under DOS 1.1 and 128K under DOS 2.0 and 2.1.
- Most programs will be written to run on monochrome and color display; however, some games and utilities may be developed for color display only. (Monitor vs. TV recommended)
- Most programs will be written in advanced BASIC; however, some machine language and compiled code may be used.
- All disks are fully tested and guaranteed to run. Damaged or faulty disks will be replaced at no charge
- All programs and documentation are copyrighted by Ziff-Davis Publishing Company. All rights or reproduction in all forms and media strictly observed. We guarantee full satisfaction!

BUSINESS AND FINANCE AIDS: Advanced pie, bar and line chart graphics...computa loan payment tables...calculate the Present Value and Internal Rate of Return for investmants...Visicalc® tamplates for Real Estate, Lease/Purchase and Tax Shelter Analysis.

HOME/PERSONAL PROGRAMS: Income tax return helper...maintain mailing lists...personal cash flow analyzer...speed reading training...SAT test preparation aids...games of dexterity, skill and MORE!

UTILITIES AND DIAGNOSTICS: Print graphics and screen images...simulate a conversational terminal...sort files...transfer files to or from another computer...diagnose and correct problems!

ALL THIS FOR AS LITTLE AS $3 PER PROGRAM!

SAVE OVER $60 ON PC DISK MAGAZINE

PC DISK MAGAZINE
P.O. Box 5930, Cherry Hill, NJ 08034

YES, I want to begin to build my library with PC DISK MAGAZINE for:

- ☐ 3 issues for $84. Save over $20!
- ☐ 6 issues for $149. Save over $60!
- ☐ 1 issue for $34.95—SPECIAL OFFER!

Mr./Mrs./Ms. _____ PD8H690

Address _____

City _____

State _____ Zip _____

☐ Payment Enclosed $_____

Charge My: ☐ American Express ☐ Visa ☐ MasterCard

Card No. _____ Exp. Date ____

Deduct an additional 10% when you pay by money order, check or credit card! (Offer valid in U.S. only.)

☐ Bill me later. Does not apply to Special One Disk offer.

Please allow 30 to 60 days for delivery of first issue. Canadian and foreign orders shipped Air Printed Matter, add $5 per issue and include payment in U.S. funds with order.

Summertime, and

SOFTWARE

ApTec *(for color Prism Printers)*
Rainbow Writer Color Text Formatter . . $119.
Rainbow Writer Screen Grabber 69
Ashton Tate
dBase II 289
Fndey! 169
Best Programs
PC/Personal Finance Program 65
PC/Professional Finance Program II . . . . 169.
PC/Fixed Asset System 297
PC/Tax Cut . . . . . 175.
Bible Research
THE WORD *(KJV Bible — 7 disks)* 145
Bruce & James
WordVision 39
Continental
Home Accountant Plus 89
FCM *(was First Class Mail)* . . . . . 79.
UltraFile *(file/report/graph)* . . . . . 109.
Digital Research
CP/M-86 39
Dr LOGO 69
Financier
Financier II *(was Personal Series)* 115
Financier Tax Series . . . . . 97.
Funk Software
Sideways 45
IUS
EasyWriter I System
EasyWriter I, EasySpeller I, EasyMailer I . . 159
EasyWriter II System
EasyWriter II, EasySpeller II, EasyMailer II . . 195
Accounts Receivable 295
Accounts Payable 295
General Ledger 295
Inventory 295
Order Entry 295
Package Price for any three above 859
Payroll 359
Lifetree
Volkswriter . . . . . 115.
Volkswriter International . . . . . 135.
Volkswriter Deluxe *(with TextMerge)* 175
Lotus Development
1-2-3 *(version 1A)* . . . . . call
Micropro
WordStar & Propak *come with quick lesson CAI training disk and tutorial disk*
WordStar 3.3 . . . . . 235.
ProPak *(WordStar/MailMerge/CorrectStar/StarIndex)* 369
Microrim
R:base 4000 . . . . . *see special*
Extended Report Writer . . . . *see special*
Clout . . . . . *see special*
Microsoft
Multiplan *(Version 1.1)* 139
Microsoft Word *(ver 1.1)* 239
Microsoft Word *with mouse (ver 1.1)* 289
Microstuf
Crosstalk XVI 105
Transporter *(includes Crosstalk)* 169
PCsoftware
PCrayon *(create in full color)* 34
Executive Picture Show 139
CREATABASE 59

PC Connection Software Speciai
through July 31, 1984

MICRORIM
R:Base 4000 (new version 1.1)
- Fully relational detabase
- 1 billion record capability
- Improved programming capebility $299

Extended Report Writer
- Expands report capabilities of standard report writer
- Allows full captions, headlines, and pege breaks $85

Clout
- Permits you to query database in plein English $125

Peachtree
PeachPak Series 4 (G/L, A/R, A/P)
new version, IBM manuals . . . . . $195.
PeachText 5000 *(with ATI Training)* 195
Pster Norton
Norton Utilities . . . . . 55.
Satellite Software
Wordperfect . . . . . call
Software Arts
TK!Solver . . . . . 269.
Financial Management Pack 85
Mechanical Engineering Pack . . . . . 85.
Software Publishing
PFS/File 89
PFS/Graph 89
PFS/Write 89
PFS/Report 79
Softword Systems
Multimate *(w/spell checker)* . . . . . call
Sorcim
Supercalc II 149
Supercalc III 199
Virtual Combinatics
Micro Cookbook 29
Warner Software
The Desk Organizer w/1 yr free updates 197

TRAINING

ATI
How to use Lotus 1-2-3 . . . . . 55.
How to use Wordster *(vol 1 & 2)* 55
How to use dBase II *(vol 1 & 2)* 55
How to use EesyWriter II. 55
How to use Multiplan 55
How to use Your IBM-PC 55
How to use MultiMete 55
How to use Microsoft Word 55
How to use PC DOS 55
How to use TK! Solver 55
Individual Software
The Instructor 35
Professor DOS 47
Tutorial Set *(both items above)* 75
Professor Pixel 47
Typing Instructor 39
Lightning Software
Master Type 35

EDUCATIONAL

Davidson
Speed Reader II *(high school & college)* $49
Meth Blaster *(grades 1-6)* 35
Word Attack *(grades 4-12)* 35
Additional Data Disks for other eges are available for Speed Reader II and Word Attack at $15. each
FriendlySoft
FnendlyWare/PC Introductory Set 35
Stone *(requires graphics board)*
Great graphics and sound
My Letters. Numbers, & Words *(ages 1 to 5)* 29
Kids Stuff *(ages 3 to 8)* 29
Across the U S A. *(ages 5 & up)* 22

GAMES

Atarisoft
Centipede 29
Pac Man 29
Dig Dug 29
Defender 29
Donkey Kong 29
Blue Giant
Hoser 25
Broderbund
Apple Panic . 23
Lode Runner 25
EPYX/Automated Simulations
Crush, Crumble & Chomp 23.
Star Warrior 27
Rescue at Rigel 23
Temple of Apshai 27
FriendlySoft
FnendlyWere/PC Arcede 35
Funtastic
Snack Attack II *(a favorite)* 27
Cosmic Crusader *(as good as above)* 27
Big Top *(climb to new levels)* 29
Master Miner *(1 or 2 players)* 29
Hayden Software
Sergon III 35
Microsoft
Flight Simuletor *(new ver.)* . 35
Orion
J-Bird. 29
PC-MAN . 27.
Peratrooper 25
Pits & Stones 29
Sierra/On-Line
Frogger 27
Crossfire *(keyboard or joystick)* 23
Ulysses end the Golden Fleece 27
Sir-Tech
Wizardry 42
Sublogic
Night Mission Pinball 29

HARDWARE

AST Research *(For IBM-PC or XT)*
All AST Boards come with SuperDrive, SuperSpool, and one year warranty
SixPakPlus 64k upgradeable to 384k, with clock calendar, serial and parallel ports *(game port optional)* 269

• DEFECTIVE SOFTWARE REPLACED IMMEDIATELY DEFECTIVE HARDWARE REPLACED OR REPAIRED AT OUR DISCRETION SOME ITEMS HAVE WARRANTIES UP TO FIVE YEARS
• COPYRIGHT MICRO CONNECTION INC 1984 ALL ITEMS SUBJECT TO AVAILABILITY PRICES SUBJECT TO CHANGE WITHOUT NOTICE IBM IS A REGISTERED TRADEMARK OF IBM CORP MICRO CONNECTION IS A TRADEMARK OF MICRO CONNECTION INC PC CONNECTION IS A REGISTERED TRADEMARK

computing is easy.

MegaPlus II 64k upgradeable to 256k (or more with MegaPak) with clock calendar and serial port *(parallel, game, or second serial port optional)* $269
MegaPak 128k *(not upgradeable)* call
MegaPak 256k call
I/O Plus II with clock calendar and serial port *(parallel, game, or second serial port optional)* 129
Parallel, Game, or second Serial Port *for any AST board (specify board)* 39
Connectall *connector bracket (PC only)* 19
AST-5251 559
AST-3780 649
MonographPlus with clock calendar, serial & parallel ports 429

Amdek
Video 300G Monitor *(green)* 149
Video 300A Monitor *(amber)* 159
Video 310A Monitor *(amber)* 179
Color II RGB Monitor 399
MAI Board *(color & monochrome)* 399

CompuCable
Plastic Keyboard & Drive Covers Set 17
IBM Mono Screen Enhancement 17
Printer to IBM Cable *(specify printer)* 32
Smartmodem to IBM Cable 25

Curtis
Low Profile Tilt & Swivel Pedestal *(for any monitor)* 44
PC Pedestal *(for IBM Mono or Color)* 55
PGS or Quadchroma display adapter 9
System Stand *(holds PC vertically)* 21
Extension Cables for IBM Mono Display 40
Keyboard Extension Cable *(3 to 9 feet)* 32
AC Plug Adapter *(any monitor to your PC)* 8

Epson
RX-80 with GRAFTRAX-Plus call
RX-80 F/T with GRAFTRAX-Plus call
FX-80 with GRAFTRAX-Plus call
RX-100 with GRAFTRAX-Plus call
FX-100 with GRAFTRAX-Plus call
LQ 1500 *(letter quality dot matrix)* call
Printer to IBM Cable (specify printer) 32

Hayes
Smartmodem 300 209
Smartmodem 1200 489
Smartmodem 1200B *(w/Smartcom II)* 409
Smartcom II 99
Compucable's Smartmodem-to-IBM Cable 25

Hercules Computer
Hercules Graphics Card *(parallel port)* 339
Hercules Color Card *(parallel port)* 179
Graph-X Software 42

IDS
Prism 80 Printer *(with all four options)* 1397
Prism 132 Printer *(with all four options)* 1597
Prism to IBM Parallel Cable 32

Koala
Koala Touch Tablet *with software (connects to game port)* 89

Kraft
Joystick 39
Game Paddles *(pair)* 29

PC Connection Hardware Special
through July 31, 1984

TEAC
Half Height Disk Drive 5 ¼" (FD-55B)
- Double Sided/Double Density
- Formats 320k w/DOS 1.1
- Formats 360k w/DOS 2.0 & DOS 2.1
- Fully IBM-PC (and XT) compatible
- Preconfigured for Drive A or Drive B
- Step by step installation instructions supplied
- Covered by 1 year manufacturers warranty $165

Free mounting bracket & 'y' power cable with each pair purchased

LIFE IN THE PC FAST LANE

Our goal is to have what you want when you want it. On those rare occasions when we tell you we're out of stock, it means one of several things. The manufacturer is out of stock. A new, favorable review has created heavy demand. An announced product is still unavailable. Or, an updated version of the product is on the way, and we have no intention of selling an about-to-be-obsolete product (even if it means losing a sale). Whatever the reason, rest assured we'll give as firm an availability date as possible.

OUR POLICY

- We accept VISA and MASTERCARD.
- No surcharge added for charge cards.
- Your card is not charged until we ship.
- No sales tax.
- All shipments insured, no additional charge.
- Allow 1 wk. for personal & co. checks to clear.
- COD max. $500. Cash or certified check.
- 120 day guarantee on all products *
- To order, call us anytime Monday thru Friday 9:00 to 9:00, or Saturday 9:00 to 5:30.

SHIPPING

Continental US: For monitors, printers, and drives, add 2% to all orders. For all other items, add $2 per order for UPS surface, $3 per order for UPS 2nd-Day-Air. We particularly recommend 2nd-Day-Air if you live west of the Mississippi or south of Virginia. In most cases it will only add $1 to your cost and will save you up to four days on delivery time. UPS Next Day Air also available. **Outside Continental US:** We add freight charges to credit card purchases. For prepayment, call 603/446-3383 for information.

1-800/243-8088

PC Connection 275M
6 Mill St., Merrow, NH 03456
603/446-3383

For the IBM-PC *Exclusively.*

CIRCLE 339 ON READER SERVICE CARD

Maynard Electronics
Floppy Drive Controller $165
Internal Hard Disk (10 Meg), WS-1 Controller & ROM for PC mother board 989.
Internal Hard Disk (10 Meg), WS-2 Controller & ROM for PC mother board 1169

Mouse Systems
PC Mouse *(w/software & desk pad)* 197.

NEC
Spinwriter 3550 *(IBM-PC compatible)* 1679
Spinwriter 2050 *(3550's little brother)* 869

Paradise Systems
MultiDisplay Card *(color & monochrome)* 379.

Plantronics/Frederick
COLORPLUS *(now w/Color Magic)* call

Princeton Graphics
HX-12 RGB monitor *(690 x 240))* call
SR-12 RGB monitor *(690 x 480)* call
MAX-12 Amber monochrome monitor call

Quadram
We are a full line Quadram Dealer
New Expanded Quadboard 64k expandable to 384k, with clock calendar, parallel, serial & game port, I/O bracket, and Quadmaster software 269
Microfazer Printer Buffer (parallel) w/copy
MP 64 (64k) *upgradable to 512k* 197.
Quadcolor I 197
Quadcolor II upgrade *(must have Quadcolor I)* 219
Quadchrome RGB Monitor 497.
Quadlink *(allows you to run most Apple II programs directly on your IBM-PC or XT)* 459
Quadisk *(various sizes to 72 meg)* call

Silver Reed *(letter quality, 132 column)*
Silver Reed EXP 550 Printer (16 CPS) 549
Silver Reed EXP 770 Printer (30 CPS) 889

TG
Joystick 45

USI *(monitors for graphics board)*
Pi-2 Monitor (12" green, with cable) 119
Pi-3 Monitor (12" amber, with cable) 129

DRIVES

All drives are completely pre-tested. Specify Drive A or Drive B for your PC. Comes with complete step by step installation instructions. Drives are 320K/360K

Tandon
TM 100-2 (5 ¼") *full-height drive (DS,DD)* 229.

TEAC
FD-55B (5 ¼") *half-height drive (DS,DD) Free 'y' cable & bracket with each pair* *see special*

MEMORY

64k Memory Upgrade Set for IBM-PC or XT system board 59
64k Memory Upgrade Set for any memory board *specify make of board* 59
Install memory upgrades & run diagnostics *at time of board purchase only* 10

PC CONNECTION®

Mom™ works best with CICS, TSO, & CMS.

PC/COM™ Provides Full File Management From Micros to Mainframes.

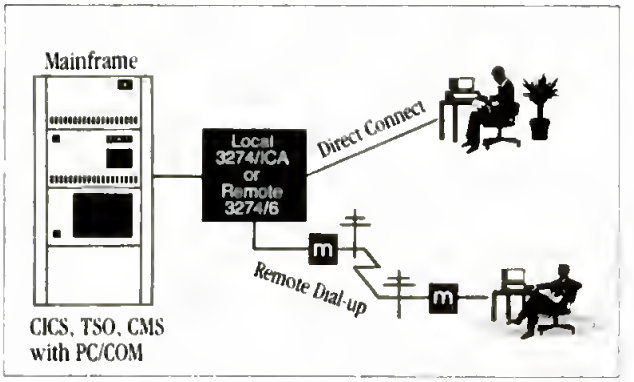
At last. MOM closes the gap between mainframe power and microcomputers. With an ingenious piece of software that works with the current IBM operating systems (CICS, TSO & CMS). It's called PC/COM and, quite frankly, it's a wonder of a micro-to-mainframe link.

Wait 'til you see MOM's PC/COM in action. Suddenly, your traditional stand-alone IBM PC becomes an integrated workstation. You gain access to your corporate data base faster and much, much easier.

With the press of a single function key, PC/COM provides:

- full file management capabilities
- high speed transfer
- spread sheet format support
- multi-file access
- unattended file transfer
- data security/integrity
- menu-driven friendliness
- field and record selectivity
- full DOS implementation
- back-up/restore

MOM's PC/COM is one of the fastest ways to transfer information. And talk about flexible. PC/COM works with either an emulator board or protocol converter, in either a direct connect or remote dial-up environment. Any way you look at it—or use it—MOM maximizes your capabilities and minimizes the amount of time that's required to handle information. Here's how PC/COM works in the scheme of things:



You'll be hard pressed to find anything work as fast or as friendly as PC/COM. Call **1-800-241-1170** to talk to MOM about the equipment you have and the capabilities you need. MOM knows how to make your CICS, TSO or CMS work like never before. And how to get increased performance out of your micros. Be sure to ask MOM about her special site-license agreement.

Remember, MOM knows best.

MOM™

Specialists in Marketing of Micros to Mainframes.

MOM and PC/COM are trademarks of National Product Marketing, Inc.

© 1984 The MOM Corporation. National Product Marketing, Inc., Two Northside 75, Atlanta, GA 30318. 404/351-2902.

CIRCLE 275 ON READER SERVICE CARD

NOW AVAILABLE!

StorageMaster™ Fixed Disk builds stronger PCs three ways.

If you own an IBM PC, the new StorageMaster 500 Series Fixed Drives from Control Data give you three great advantages.

- Larger capacity than IBM's fixed disk drive. The StorageMaster 518 offers up to 18 megabytes of storage; the StorageMaster 530 capacity of 30 megabytes is the equivalent of 15,000 double-spaced typewritten pages.
- You can boot* (start up) from StorageMaster 500 Drives—no need to boot up from a flexible disk as with other drives.
- More byte for the buck. Dollar for dollar, StorageMaster gives you more bytes of storage than IBM's fixed disk drive.

There's more. The 500 Series Drives have an average seek time of only 45 milliseconds—about twice as fast as most other drives. They store your information in a sealed, contamination-free environment. They require no cleaning or preventive maintenance. And they come ready to plug into your PC.*

Look for the 500 Series Drives at your local computer store. Or give us a toll-free call at 800/232-6789 (in Minnesota, call 612/921-4400, ext. 41) and we'll tell you where you can find our whole family of StorageMaster products.

*This capability requires the use of a StorageMaster 301 Controller.

CONTROL DATA

CIRCLE 165 ON READER SERVICE CARD

NEW POWER For Constructing Financial Models

Financial modeling languages, such as Ferox Microsystems' ENCORE! package, are newly available for the PC. They can perform financial analysis tasks too complex for spreadsheets.

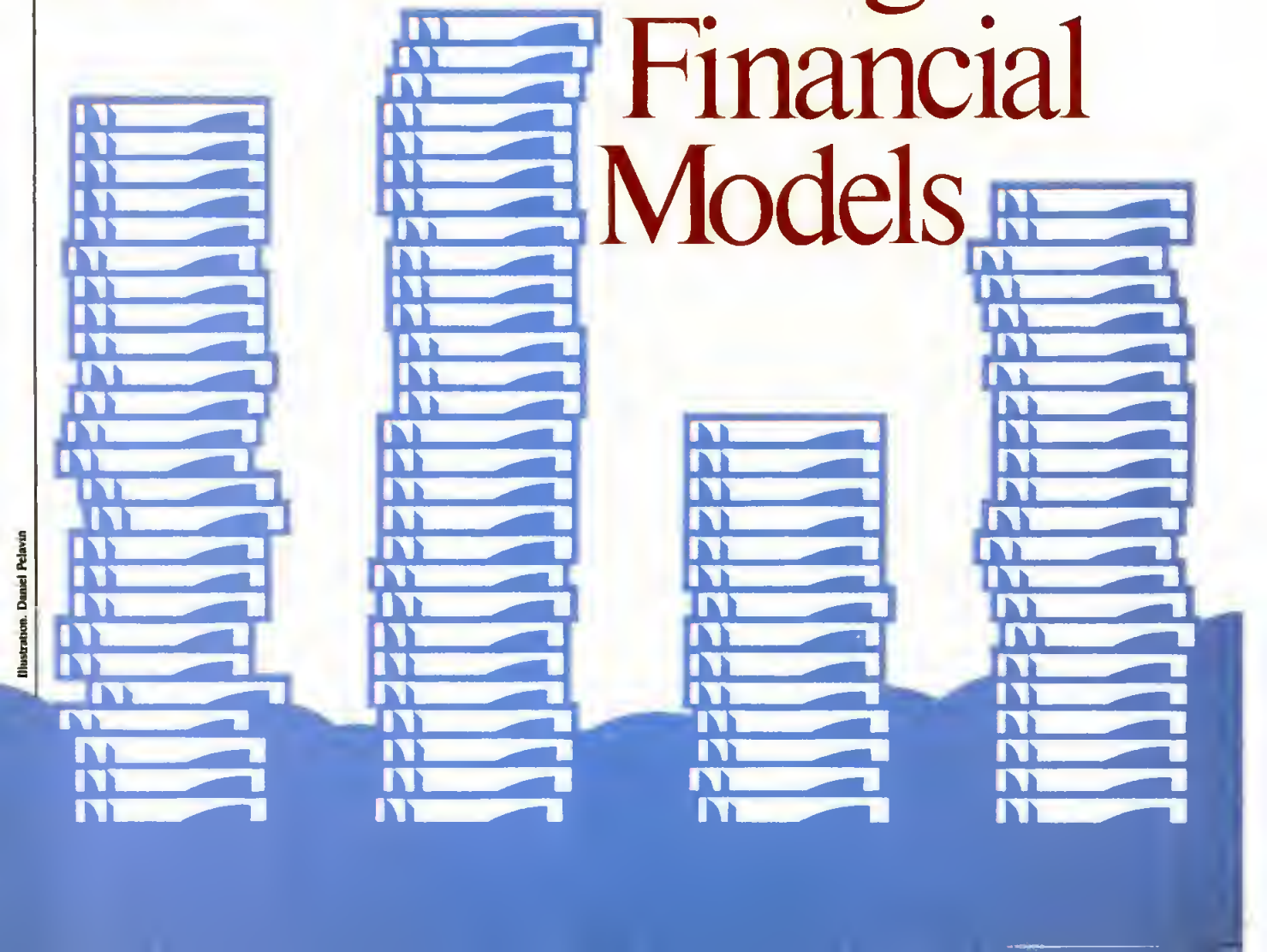


Illustration: Daniel Pelavin

PELAVIN

Corporate financial managers often need to create financial models for planning, analyzing alternatives, budgeting resources, and measuring profitability. These models simulate reality—the company and its structure—in economic terms and can be manipulated to answer "what-if" questions about the company's future actions.

Although sophisticated software for financial modeling, which is often written in special financial modeling languages, has long been available for mainframe computers, the only available software for performing this task on the PC has been spreadsheets. No matter how sophisticated, spreadsheets can perform only a limited amount of financial modeling. Now, however, down-sized versions of mainframe financial modeling languages are being marketed for the PC. One such package is *ENCORE!* by Ferox Microsystems, Inc., a sophisticated and capable product that has most of the features typically found in a mainframe financial modeling language.

Compare and Contrast

Because financial modeling languages for the PC are so new, you need to take the time to understand the differences between these languages and spreadsheets before you can decide whether you need such a package for your analyses.

One major difference is in the complexity of problems each can handle. Consider the following analogy. Suppose you are a contractor. When you start a new house, you choose a steamshovel to help you clear the land and dig the basement. On the other hand, if you need to move a couple of cubic feet of dirt from a truck bed to your flower garden, you choose a shovel. It's easy in these extreme cases to pick the right tool for the job, but when the level of effort falls somewhere between two such extremes, you have to take more factors into consideration. You consider the time and expense tradeoff between using the steamshovel and the shovel. You also consider the time and effort it will take to learn to use the steamshovel. After all, you already know how to use the shovel!

If you need to develop a production financial modeling application that involves a complete 5-year financial plan showing the integrated financial statements for each of 45 departments within seven divisions and, finally, the consolidated financial plan for a corporation with $200,000,000 in assets, then a financial modeling language would probably be the best software package to use.

On the other hand, if you are comparing the 4-year operating costs of car A and car B and you need only vary a few simple assumptions—say the loan interest rate and each car's miles per gallon—a spreadsheet will be faster and more efficient.

Another important difference between the two types of programs is in the way in which you describe the model to the computer. For example, either a spreadsheet or a financial modeling language could be used to describe and solve the simple financial model sketched out in Figure 1. With a spreadsheet, you would set up this model as shown in Figure 2 and describe the Gross Profit variable as follows: move the cursor to the spreadsheet cell at the intersection of the column labeled This Year (column B) and the row labeled Gross Profit (row 5). Enter the year's Gross Profit figure. Then you move the cursor (in the same row) to column C (the first year of the forecast) and insert a formula along the lines of C4 = C3–C9 to describe the relationship between Gross Profit, Sales, and Cost of Sales. You move the cursor to column D and copy the formula into the remaining columns representing the forecast years.

To describe the same formula to the computer using the financial modeling language, you type:

```
'GROSS PROFIT' =
```

Variables	This Year	<-------Forecast Years------->
Units Sold		Data as projected
Price		Data as projected
Sales ($M)		Units Sold × Price
Gross Profit		Sales—Cost of Sales
Profit Before Tax		Gross Profit—Administrative Expenses
Net Profit		Profit Before Tax—Estimated Taxes
Margin (%)		Net Profit as a Percent of Sales
Notes:		
Cost of Sales		A Percentage of Sales—(use 67%)
Administrative Expenses		Increasing from "This Year" with Inflation at 10% (next year) and 12% thereafter
Estimated Taxes		Use the Standard U.S. Tax Tables for Corporations

Figure 1. *Sample notes for a model for a 5-year profitability plan.*

ENCORE!
Ferox Microsystems, Inc.
1701 N. Fort Meyer Dr., #611
Arlington, VA 22209
(703) 841-0800
List Price: $695
Requires: 256K RAM, two double-sided disk drives or hard disk.

CIRCLE 744 ON READER SERVICE CARD

'SALES' – 'COST OF SALES'

As you can see, the financial modeling expression of Gross Profit is much closer to its English equivalent than the spreadsheet expression. In fact, the definition of an entire model in a financial modeling language looks similar to the way you might define the problem on paper. Figure 3 shows how the worksheet model in Figure 1 is described to the computer using *ENCORE!*

The way you describe the problem to the computer is the most immediately noticeable difference between spreadsheets and true financial modeling languages. The difference in their abilities to handle complex problems may not become obvious until you reach the point in developing an application where you begin to stretch the limits of the spreadsheet. For instance, you may need to consolidate several divisions into the corporate 5-year plan while taking into account several interdivision transfers. You realize that with the spreadsheet, you have no easy way to perform the consolidation and still include the financial allocations among divisions. Here, a financial modeling language will become useful.

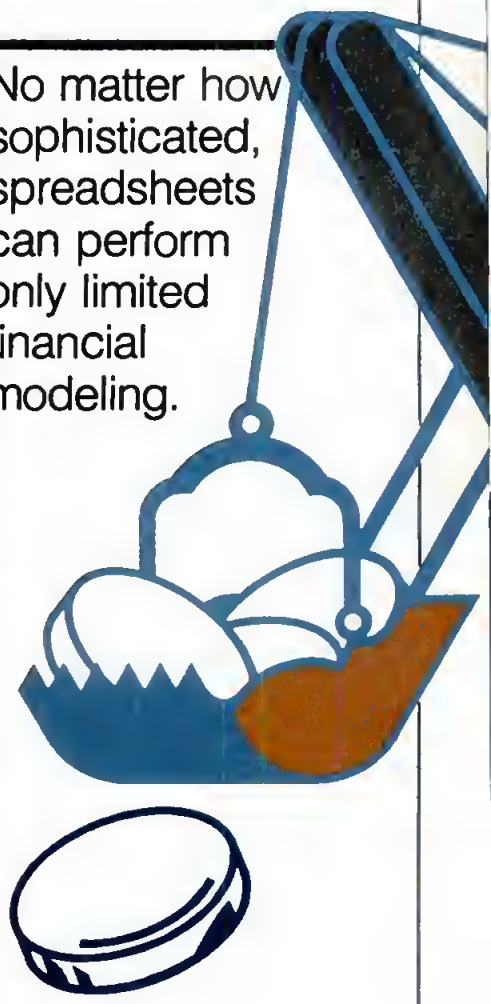
Several features are available in financial modeling languages not found in most spreadsheets. Lotus' *Symphony* and Ashton-Tate's *Framework* have more capabilities than many present-day spreadsheets, but even these powerful integrated programs do not offer all the features standard in a full-blown financial modeling system. Some of the features that distinguish financial modeling languages from spreadsheets are:

- **Simultaneous equations.** All financial modeling languages should have the ability to solve simultaneous equations. The equation

$$X=e^{-X}$$

(where e is the constant 2.718 . . .) is a simple example of a simultaneous equation. The only way this can be solved is through a series of recursive iterations using trial substitutions to search for the value of x that makes the equation true. (The only product on the market now other than financial modeling languages that can solve simultaneous equations is Software Arts' *TK! Solver*.)

An example of a frequent "real world" use for simultaneous equations occurs in an integrated income statement and balance sheet model. Profits from the income statement and interest expense on short-term debt are passed, respectively, to the asset and liability sides of the balance sheet. A set of recursive and iterative equations must be processed to get share-




```
A20:                                                          READY

          A                    B          C        D        E        F
1   VARIABLES              This Year      1985     1986     1987     1988
2   Units Sold
3   Price
4   Sales ($M)
5   Gross Profit
6   Profit Before Tax
7   Net Profit
8   Margin(%)
9   Cost of Sales
10  Administrative Expenses
11  Estimated Taxes
```

Figure 2: *The Figure 1 model laid out as a spreadsheet.*

holder's equity plus assets to equal total liabilities while maintaining the relationships of all the variables in the other balance sheet equations. Equations of this type occur in financial models more often than you might think, and you'll need the power of a modeling language to deal with these interrelated equations and relationships among variables. Spreadsheets can not easily handle this task.

• **Command files.** If you perform the same analysis for new data each month and produce the same reports, it is helpful to have a command file to store the keystrokes (or commands). Financial modeling languages have extensive command file capabilities. For instance, you may need each month to allocate data processing expenses to each corporate division based on factors that accumulate to each division throughout the month, such as training courses and materials supplied, number of PCs installed, consulting hours spent by corporate data processing personnel, and central processing units used on the corporate mainframe. With a financial modeling language command file you can develop a procedure to allocate the corporate data processing expenses for the month according to the factors collected by division. This procedure can then be used over and over each month to perform the proper interdivision transfers to allocate the data processing expenses fairly to the divisions using these services.

This financial application would be difficult to construct using most spreadsheets. Lotus' *1-2-3* has a macro facility that partially addresses this shortcoming, but *1-2-3*'s macro language is rather cryptic and difficult to set up for a complex production analysis.

• **Extensive built-in functions.** Many built-in mathematical, statistical, and financial functions are included as standard routines in financial modeling languages. Some examples include loan amortization, tax loss carry-forward analyses, accelerated cost recovery system (ACRS) depreciation, non-ACRS depreciation, internal rate of return, net present value, and statistical regression. These built-in functions allow you to spend your time using their results rather than developing the logic for them in the body of a spreadsheet.

```
INPUT 'UNITS SOLD' = 780,835,895,950,1020,1200
INPUT 'PRICE' = 10,11,12,14,15,17
      'SALES' = 'UNITS SOLD' *  'PRICE'
      'COST OF SALES'= 0.67 * 'SALES'
      'GROSS PROFIT' = 'SALES' - 'COST OF SALES'
INPUT 'ADMINISTRATIVE EXPENSES'=725,10%,*12%
      'PROFIT BEFORE TAX' = 'GROSS PROFIT' - 'ADMINISTRATIVE EXPENSES'
      'ESTIMATED TAXES'= 'PROFIT BEFORE TAX' USTAX 5.0
      'NET PROFIT' = 'PROFIT BEFORE TAX' - 'ESTIMATED TAXES'
      'OPERATING MARGIN' = 'NET PROFIT' / 'SALES'
```

Figure 3: *Description of the Figure 1 model using* ENCORE!.

Demo Report Using ENCORE!
XYZ Corporation
September 31, 1983

1		2	3	(000) 4	5
	REVENUES				
$ 2,500	SALES	$ 2,750	$ 3,162	$ 3,637	$ 4,182
850	COST OF SALES	908	949	1,091	1,255
1,650	GROSS PROFIT	1,843	2,214	2,546	2,928
	EXPENSES				
375	DEPRECIATION	700	820	845	840
100	SALARIES	112	125	140	157
375	COMMISSIONS	413	474	546	627
45	ADVERTISING	48	51	54	57
278	OVERHEAD EXPENSES	292	306	322	338
23	OFFICE SUPPLIES	23	23	23	23
100	MISCELLANEOUS	110	121	133	146
1,296	TOTAL EXPENSES	1,697	1,921	2,063	2,189
	PROFIT				
354	NET PROFIT BEFORE TAX	145	293	483	739
53	CORPORATE TAX	22	44	72	111
$ 301A	NET PROFIT AFTER TAX	$ 124	$ 249	$ 411	$ 628

A - THIS IS OUR TARGET NET PROFIT AFTER WE CONSIDERED ALL OF THE NECESSARY GAAP PROCEDURES ETC, ETC,

	ANALYSIS				
(1,824)A	NET CASH FLOW	(176)	569	1,256	1,468
516A	NET PRESENT VALUE	-	-	-	-
27.95%	INTERNAL RATE OF RETU	-	-	-	-

Figure 4: *Profit planning report produced by* ENCORE! *for XYZ Corporation showing Net Profit Before Tax with initial assumptions.*

• **Goal seeking.** All spreadsheets allow you to ask "what-if" questions by changing the data and recalculating. But what if you want to ask a "what-if" question "backwards"? Say, for example, you want to know what level of sales you need to make a certain amount of profit. A spreadsheet can only compute the bottom line profit figure based on an assumed sales level. It can't take a target figure for profit and try different sales figures until it

reaches that target. This backwards "what-if" question is called goal seeking; financial modeling languages perform this type of analysis routinely.

ENCORE!

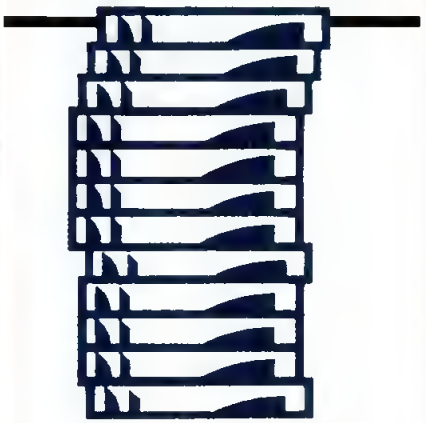
ENCORE! is one of the first software products to bring these mainframe financial modeling language capabilities to the IBM PC. It is a capable program that will solve extensive financial models without running out of steam. Besides its financial modeling logic, *ENCORE!* includes a spreadsheet, an editor, a command file processor, and built-in file-handling utilities. *ENCORE*'s greatest advantage over a spreadsheet is realized only in complex production financial problems. Its extensive command file capability, called EXEC!, allows it to take on complex financial data processing applications. Its only practical limitation is the size of your PC's memory and disk storage. With *ENCORE!*'s EXEC! system, you can set up practically any monthly financial production system as a menu-driven application that anyone could run.

ENCORE!'s second advantage over a spreadsheet is its English-language model syntax. You describe the model in natural-looking syntax similar to what you would use in defining the problem to your data processing department (see Figure 2). This syntax can be a valuable asset. The English-language description substantially reduces the learning curve the second time you develop a model. The syntax can be printed out for viewing, and you can use modeling techniques from previous models again. A description of the spreadsheet logic used is much more cryptic looking than the same model written in *ENCORE!*

I was particularly impressed with how easily *ENCORE!* performs goal-seeking analysis. Here's an example that shows how the goal-seeking feature works.

Figure 4 shows a report from an *ENCORE!* model for a 5-year plan using an initial set of assumptions about the planned revenue projections. In particular, note the Sales and the Net Profit Before Tax figures.

Suppose you are the owner of XYZ Corporation (see its profit plan in Figure 4.) You want your plan to show a break-even figure for the first year (Net Profit Before Tax = 0 in column 1) with the following profit before tax figures for the remaining years: year 2= $100,000, year 3= $500,000, year 4= $1,000,000 and year 5= $1,500,000. (Note that figures are shown in thousands in the report.) You want the answer to the question, What sales revenues would we need in years 1 through 5 to achieve our Net Profit Before Tax goals in the first 5 years?



ENCORE! has extensive reporting capabilities that allow you to format any report you might need.

Figure 5 shows what appears on the display screen when the first iteration and the last (third) iteration of *ENCORE!*'s goal-seeking analysis are complete. It took only three iterations through the model for *ENCORE!* to solve for all 5 target years for Net Profit Before Tax. The third iteration shows the sales figures needed to generate the corresponding profit figures in each of the first 5 years. (Sales for year 1= $1,805,900, year 2= $2,662,700, year 3= $3,539,100, year 4= $4,576,400, and year 5= $5,566,300. Year 6 is also computed in the model but not shown on the reports.)

Figure 6 shows the full report with the profit targets and the sales required to reach those targets. Note that all other relationships still hold true in each report even though the sales and profit figures are different. For instance, the equation Net Profit Before Tax = Gross Profit−Total Expenses is still true in each report, although the figures used to calculate them have obviously changed.

ENCORE! has extensive reporting capabilities that allow you to format any report you might need. The report writer is straightforward and easy to use. The package also produces good graphics. It will make line graphs, pie charts, and side-by-side and stacked bar charts. You can annotate the graphs by placing comments anywhere that you need to. The comments can be enclosed in a box to highlight them if necessary. Screen graphs can be reproduced on the IBM dot matrix printer or an Epson printer with the Graftrax option.

Graphs sent to the dot matrix printer are produced by using the Shift-PrtSc key combination. Unfortunately, the resolution that results from using this approach is not as good as the resolution you achieve with *1-2-3*'s printer graphics. However, *ENCORE!* also supports pen plotters such as the Hewlett-Packard 7400 series and the 7200 series plotters, on which the graph resolution is much better.

On the Negative Side

ENCORE! does have some drawbacks. My biggest objection is that it is Pascal based. I have never seen a program written in Pascal that runs at a decent speed. It takes an unnecessarily long time to boot up *ENCORE!*, select the spreadsheet module, and load a short model (2¼ minutes). This may or may not seem like a long time to you, but if you have to do it several times each day, you do get tired of listening to your system "bump and grind" as it

loads up *ENCORE!* It also takes a long time to move from one module of the system to the other.

For instance, using the model shown in Figure 3, it took 2½ minutes to move out of the spreadsheet module, make a change in model logic with the editor, return to the spreadsheet, and load and recalculate the model using the new logic. (In all fairness to *ENCORE!*, you can make some temporary model logic changes "on the fly" without having to leave the spreadsheet and enter the editor.)

Pascal-based systems cause a multitude of problems for IBM PC users. For example, *ENCORE!* has a reasonably good built-in editor, but I already know how to use a perfectly good DOS-based editor. I can't use the DOS editor with *ENCORE!*, because the program uses Pascal disk formatting. If you really need to use it, *ENCORE!* does have a way to transport DOS files to Pascal and vice versa. In general, however, *ENCORE!* is a fine financial modeling package. I hope Ferox will consider rewriting the program in a DOS-compatible language.

> One minor ENCORE! irritant is the quotation marks required around all the variables used in the model.

```
        *** Goal Seeking...     SCOREBOARD      Iteration #1
  Targets found so far: 0 out of 6

----- Variable -----  ------------ Target ------------   How
          SALES                NET PROFIT BEFORE TAX      Far
Column          Value   Column          Value       Goal    Off   0% .. 100%

1..........    2,500.0 31..........      354.0        0.0  354.0  ||||||||||
2..........    2,750.0 32..........      145.4      100.0   45.4% ||||
3..........    3,162.5 33..........      292.9      500.0 (41.4)% |||
4..........    3,636.9 34..........      483.3    1,000.0 (51.7)% ||||
5..........    4,182.4 35..........      738.8    1,500.0 (50.7)% ||||
6..........    4,809.8 36..........    1,555.1    2,000.0 (22.2)% |
```

```
        *** Goal Seeking...     SCOREBOARD      Iteration #3
  Targets found so far: 6 out of 6

----- Variable -----  ------------ Target ------------   How
          SALES                NET PROFIT BEFORE TAX      Far
Column          Value   Column          Value       Goal    Off   0% .. 100%

1..........    1,805.9 31..........        0.0        0.0    0.0
2..........    2,662.7 32..........      100.0      100.0    0.0%
3..........    3,539.1 33..........      500.0      500.0    0.0%
4..........    4,576.4 34..........    1,000.0    1,000.0    0.0%
5..........    5,566.3 35..........    1,500.0    1,500.0    0.0%
6..........    5,618.7 36..........    2,000.0    2,000.0    0.0%

All targets found! Press <spacebar> to continue -->
```

Figure 5: ENCORE! *goal-seeking results after the first and third iterations.*

Not Nonprocedural

Another *ENCORE!* drawback is that it is not a nonprocedural language. A nonprocedural modeling language allows you to describe the model to the computer in any equation or variable sequence you like. The computer will then locate all the variables (as long as they are defined *somewhere* in the model) and compute all model equations correctly. Consequently, with a nonprocedural modeling language you don't have to worry about the order in which the model logic appears. You can concentrate on the relationships of the variables in the model and make sure the logic is correct.

Since *ENCORE!* is procedural, you have to define a variable used in an equation before the equation using that variable appears in the model. For instance, the notes at the bottom of the model definition in Figure 1 concerning the assumptions about inflation, cost of goods sold, and administrative expenses had to be moved up to the appropriate places in the model logic (see Figure 3). The *ENCORE!* model did not produce accurate answers when the definitions of these variables were left as notes at the end of the model (as shown in Figure 1).

Also, if you are constructing a model with *ENCORE!* that has a simultaneous equation somewhere in it, you must use programming techniques such as DO loops and DOWHILE statements similar to those found in BASIC and FORTRAN. With nonprocedural languages, learning these programming techniques is not necessary for using simultaneous equations.

One minor irritant is the quotation marks required around all the variables used in the model (see Figure 3). I left one off once and got an error message when I tried to compile the model. The error message said future versions of *ENCORE!* would not require you to enclose the variables in quotation marks. I am glad to see

Demo Report Using ENCORE!

XYZ Corporation

September 31, 1983

1		2	3	(000) 4	5
	REVENUES				
$ 1,806	SALES	$ 2,663	$ 3,539	$ 4,576	$ 5,566
614	COST OF SALES	879	1,062	1,373	1,670
1,192	GROSS PROFIT	1,784	2,477	3,203	3,896
	EXPENSES				
375	DEPRECIATION	700	820	845	840
100	SALARIES	112	125	140	157
271	COMMISSIONS	399	531	686	835
45	ADVERTISING	48	51	54	57
278	OVERHEAD EXPENSES	292	306	322	338
23	OFFICE SUPPLIES	23	23	23	23
100	MISCELLANEOUS	110	121	133	146
1,192	TOTAL EXPENSES	1,684	1,977	2,203	2,396
	PROFIT				
0	NET PROFIT BEFORE TAX	100	500	1,000	1,500
0	CORPORATE TAX	15	75	150	225
0	NET PROFIT AFTER TAX	$ 85	$ 425	$ 850	$ 1,275

A - THIS IS OUR TARGET NET PROFIT AFTER WE CONSIDERED ALL OF THE NECESSARY GAAP PROCEDURES ETC, ETC,

	ANALYSIS				
(2,125)A	NET CASH FLOW	(215)	745	1,695	2,115
1,024A	NET PRESENT VALUE	-	-	-	-
32.96%	INTERNAL RATE OF RETU	-	-	-	-

Figure 6: *Profit planning report produced by* ENCORE! *for XYZ Corporation after setting goal-seeking targets for Net Profit Before Tax.*

that Ferox is addressing this point.

ENCORE!'s well-written manual is over 700 pages long and gives many good examples. One of its first pages also lists a phone number you can call anytime from 9 a.m. to 6 p.m. Eastern time to ask questions about the correct operation of *ENCORE!* Ferox promises to answer as many questions as you have and does not charge for the service. The company also offers 2-day classes (for a fee currently set at $400) to all interested users.

Conclusions

Financial modeling languages should not be used for all spreadsheetlike problems. They are most useful for the more extensive financial modeling problems usually found in medium- to large-sized businesses. If you think the application you are about to start might need a fairly complex financial model to adequately represent "reality," then it's possible that your spreadsheet might not be up to handling it. Of course, on the other hand, you shouldn't buy a steam shovel to do the work of a trowel.

If you are responsible for financial planning in any business, you will probably need both a spreadsheet and a good financial modeling language. If you do investigate financial modeling languages, *ENCORE!* is one package you should consider. ■

PC SOFTWARE SALE!

WE'LL MATCH PRICES ON MOST PRODUCTS

LOTUS CALL
WORDSTAR $229
RBASE 4000 $315
dBASE II/III CALL
WORDSTAR PROF PAK $359
EASYWRITER II SYSTEM $185
HAYES SMARTMODEM 1200 $489
AST SIX PAK PLUS $269

LOOK AT THESE SPECIAL PRICES!

ATI Training Power	CALL
Crosstalk	$ 99
dBase II/III	CALL
Database Manager II	$199
EasyWriter II System	$185
Hayes Smartmodems	CALL
InfoStar	$249
IUS Accounting	CALL
Lotus 1-2-3/Symphony	CALL
MicroPro Products	CALL
Microsoft Word	$289
Microsoft Products	CALL
Multimate	$269
Peachtext 5000	$189
ProKey	$ 87
Quadram Quadboards	CALL
RBase 4000	$315
SuperCalc 2	$155
SuperCalc 3	$219
VisiCorp Products	CALL
Volkswriter Deluxe	$175
Wordstar	$229
Wordstar Prof. Package	$359
All Other Products	CALL

To order:
Call TOLL-FREE:
800-227-4780 or 415-845-2651

Or write:
ECONOMY SOFTWARE
2040 Polk Street
San Francisco, CA 94109

ECONOMY SOFTWARE

- ☐ We guarantee our products against manufacturer's defects.
- ☐ Quantity discounts available. We are experienced with Corporate accounts.
- ☐ No surcharge added for charge cards. No charges until products are shipped.
- ☐ Purchase orders accepted.
- ☐ Call for shipping charges.
- ☐ Prices subject to change.

CIRCLE 119 ON READER SERVICE CARD

If you're using VisiCalc,® Lotus 1-2-3,® MultiPlan,® SuperCalc® or PerfectCalc,® you need an analyst.

Specifically, a financial analyst. Like the BottomlineV software package. Because unless you've got hundreds of hours for programming, you'll go nuts doing financial planning, analysis, modeling or five-year forecasting with spreadsheet software alone.

Your personal financial advisor.

BottomlineV takes the mystery out of financial analysis and planning. Working with your spreadsheet software, it gives you instant access to the same profitability measures and financial ratios that bankers use to test investment soundness.

BottomlineV instantly produces the reports you need to see your complete financial picture

You'll know in seconds important long-range information—the kind of facts and figures that give you credibility when you establish lines of credit, raise venture capital or obtain a loan.

No programming required.

BottomlineV makes forecasting and modeling easy because it does hundreds of complicated calculations for you. That's right, it does hundreds of calculations. If you make a change to any part of your model, it will ripple through the entire model. Automatically updating it.

For example, suppose you want to know how an increase in sales will affect your profit picture.

BottomlineV will tell you.

First, it will revise your income statement (P&L).

Then it will update your balance sheet and cash flow to see if your goal is achievable.

It will even give you 24 different ratio analyses that will help you better plan and run your business.

With BottomlineV, you don't have to know computer programming. You don't have to be an accountant. You hardly even have to know how to operate your spreadsheet software. Yet you will be able to see your complete financial picture. Instantly.

BottomlineV works with IBM,® Apple,® Kaypro,® DEC® and most other MS-DOS and CP/M systems.

It sells for only $295.00. For that kind of money, no other financial analyst can give you so much good advice.

Go to your nearest dealer and ask for a BottomlineV demo. (Also ask about our CPA-approved BottomlineTAX planning and preparation package.)

BottomlineV™

We take over where spreadsheets leave off.

Strategic Software Systems, Inc., 1300 Dove Street, Suite 200, Newport Beach, CA 92660 (714) 476-2842

VisiCalc Lotus 1-2-3 MultiPlan SuperCalc PerfectCalc IBM Apple Kaypro DEC and BottomlineV are registered trademarks of respectively VisiCorp Lotus Development Corp Microsoft Corp Sorcim Corp Perfect Software Inc International Business Machines Corp Apple Computer, Inc Kaypro Corp Digital Equipment Corp and Strategic Software Systems, Inc

CIRCLE 224 ON READER SERVICE CARD

Better Business BASIC

Not too long ago, I wrote an introduction to Business BASIC and reviewed a Business BASIC interpreter from Control-C Software (see "Doing Business with BASIC," *PC*, Volume 3 Number 1). As often happens in the microcomputer market, new products have since come along and eclipsed the older one. The two new Business BASIC interpreters at hand have dramatic advantages over the Control-C product, yet each has a very different philosophy behind it. It is hard to believe that two such similar versions of a language interpreter can be implemented in such different ways, yet this is the case with Applications BASIC from Soft Gold, Inc., and SMC's Thoroughbred BASIC. Programmers may see them as peas in a pod, but to end users they are as different as jelly beans and chickpeas.

The two Business BASIC interpreters reviewed here are very similar in programming terms, but the packages provide two very different implementations of one versatile language.

Hail Business BASIC

You may be wondering just what Business BASIC is and how it differs from Microsoft BASIC. Business BASIC was developed by Basic Four Corporation in 1968 as an operating system cum language for its minicomputers. The philosophy of the developers was that the average user has no computer background and doesn't want an "educational experience" thrust upon him. Better yet, they assumed that programmers who were implementing commercial applications wanted a powerful yet simple commercial language. As Einstein put it, "Keep it simple, but no simpler." Business BASIC, like no other language, manages to do just that.

Business BASIC was developed nearly 10 years before Microsoft BASIC, and it is a far better and more powerful commercial language. I emphasize the word "commercial" because the language was designed for applications that are used in the everyday world of accounting and running a business. It won't do graphics, and it won't let you poke around to achieve animated accounts receivable. However, it employs decimal arithmetic, just like you, me, and the common adding machine. Business BASIC also supports keyed files (so, for example, you can write records to a disk file alphabetically) and its string handling is much more powerful than COBOL's or Microsoft BASIC's capabilities. Business BASIC also uses mnemonics for printing to printers or the CRT screen. Thus, CS will clear the screen, while EP might be used for expanded print on a printer. These mnemonics are defined once in a table and are then available to all programs that need to use them—any machine-dependent features are in the table, not in the programs.

Business BASIC is also tremendously transportable. You can't muck around

with machine-dependent features very easily. This amounts to a form of self-protection for 99 percent of all users. (For those who like mucking around, my suggestion is to program in C or Assembler.) Besides, since Business BASIC arose from a single original source, all later versions look pretty similar. Everyone eyed Basic Four's user base hungrily, and it's easier to get converts to your machine if it's painless for the users-to-be.

To avoid any confusion, I must note that I am not talking about what Microsoft calls "Business BASIC." That product has limited business capabilities and exists only as a compiler (which is unfortunate). In any environment, BASIC's greatest strength is that interpretive code is easy to develop and maintain. Don't confuse the products reviewed here with Microsoft's.

Having made my speech about how Business BASIC is the best thing since sliced cheese, let me burst my own balloon. It's extremely good for business applications and, oddly enough, is a marvelous language for disk utilities—it can read any sector on a disk including directories and file allocation tables. But it's dreadful for graphics. There are none. It's also not an ideal language for teen-agers, who will find Microsoft BASIC more general, Logo more fun, and APL more terse. Nor is it any good for scientists. It can't find a cosine any more than a computer can mow the lawn. But for most applica-

BetaSTAT

A POWERFUL NEW SET OF STATISTICS PROGRAMS FOR CP/M 80 AND IBM PC

- 8087 support (IBM compiled version only)
- Data base up to 192 variables
- Computations in double precision
- Storage of data on disk
- Full editing and update
- Print-out raw data
- Data skipping flag feature
- Minimum 64K
- One or multiple drives
- Compatible with other data bases
- Modular design
- Unlimited number of cases
- Analyze up to 65 variables
- Data transformations
- Any subset of data selectable
- Raw or intermediate data entry
- Totally menu driven
- All MBASIC code (modifiable)
- Data coded 1.0 permitted
- Operational with hard disk

Nonparametrics – Graphics, crosstabs, chi square, signed rank, rank sum, Fisher's test, Bayesian analysis, random sample, medians. Distrib: chi square, binomial, t, F. (Independent module for IBM only) . . . . . **N/C ***

Stepwise Multiple Regression – For up to 61 variables (straight regression up to 65 variables). Raw data, correlations, or variance-covariance entry. Each step output (addition or deletion) includes: regression coefficients, regression and residuals tables, multiple correlation coef., std. error, F-ratio, etc. Also means, standard deviations and intercorrelations. Printed listings of residuals for each observation **$120**

Factor Analysis – Principal components, VARIMAX and oblique simple structures, for up to 45 variables and factors. Also orthogonal-powered vector and weighted cross-factor simple structure methods. Raw data or correlation entry. Three estimates of communalities: units, absolute maximum row, and squared multiple correlations. Iterations **$95**

Discriminant Function – For up to 58 variables. Discriminant function coefficients, F-ratio, cutoff point and z-score cutoff points. Discriminant function data base totally compatible with Stepwise Multiple Regression and Factor Analysis (and vice versa). Dichotomous groups **$70**

Analysis of Variance – For up to 10 main effects and 10 levels, with equal cell frequencies. Cell means and standard deviations printed out. All two-way interactions evaluated. Output includes: degrees of freedom, mean square and F-ratio for all main and interaction effects **$85**

Analysis of Covariance – For up to 5 main effects with as many as 10 levels and 0 to 20 covariates. Complex least squares method. Appropriate for equal or unequal cell frequencies. All cell means and standard deviations printed. Tables include: source, degrees of freedom, mean square, F-ratio for main and interaction effects. All two-way interactions evaluated **$105**

Analysis of Variance (W + B) – Repeated measures design. Any combination of between and/or within subjects (cases) independent variables for a total of five factors. All interactions evaluated (up to five-way). Equal or unequal groups. Rerun feature permits output with modifications. From up to 1,000 to over 50,000 cases permitted (depending on the design) **$115**

Matrix Manipulation – Outputs the addition, subtraction, multiplication, inversion, and transpose of matrices of up to 40 rows by 40 columns. All menu driven. Also provides for the solution of a system of equations of up to an order of 40. Outputs to screen and/or printer **$55**

ANY SEVEN PROGRAM MODULES $245
ALL EIGHT PROGRAM MODULES $295
(Add $75 for compiled version)
Robert A. Belanger, Ph.D.
(818) 969-4112

For Purchases and Literature
BELANGER RESEARCH ASSOCIATES
541 W. 6TH ST.
AZUSA, CA 91702

IBM is a trademark of International Business Machines, Corp.
CP/M is a trademark of Digital Research, Inc.
MBASIC is a product of Microsoft Corp.

Discounts for Dealer, Institutional or Educational Purchases.
* N/C – No charge if purchased with at least one other module

CIRCLE 212 ON READER SERVICE CARD

Applications BASIC
Soft Gold, Inc.
P.O. Box 2718
Newport Beach, CA 92663
(714) 476-3004
List Price: $395. Documentation only, $65.
Requires: 64K RAM, one disk drive.

CIRCLE 733 ON READER SERVICE CARD

Thoroughbred Operating System
(comes with Thoroughbred BASIC)
SMC Software Systems
1011 Route 22
Bridgewater, NJ 08807
(800) 526-3968
(201) 685-9000
List Price: $795. Documentation only, $65.
Requires: PC-XT.

CIRCLE 734 ON READER SERVICE CARD

MICROXPRESS

EXPANSION BOARDS

AST RESEARCH
All options available. Expandable memory.
SIX PAK PLUS (64K)
MEGA PLUS II (64K)
I/O PLUS II
MPK 256K
COMBO PLUS II
FROM $130

QUADRAM
All options available. Expandable memory.
QUADBOARD
EXPANDED QUADBOARD
QUADBOARD II
FROM $240

HARD DISK SUBSYSTEMS

I² INTERFACE
Includes everything you need to become operational. IBM, Eagle, Columbia Leading Edge, Corona and Compaq compatible.
I2BM-10P (10MB)
I2BM-15P (15MB)
I2BM-21P (21MB)
I2BM-33P (33MB)
FROM $1295
TAPE BACK-UP SYSTEM
Also available. Call for best prices.

MAYNARD
10 Megabyte Winchester Hard Disc Drive Systems

WS1 (includes Sandstar Multifunction Card)
WS2 (includes Sandstar Floppy Drive Controller Card)
WS3 (includes Sandstar Memory Card)
FROM $1070

TANDON
TM 5112 10MB $1495

PRINTERS

BROTHER
Letter Quality (parallel or serial port) Accessories Available.
HR-15 Call
HR-25 Call

OKIDATA
Dot Matrix
ML 92 Call
ML 93 Call

CONTROL DATA DISK DRIVES

Full Height Drive Shown.

5¼" Flexible Full Height Disk Drive CDC 9409

5¼" Flexible Half Height Disk Drive CDC 9428

SOFTWARE UTILITIES

TALL TREE
J FORMAT-2, WINDRIVE, JETDRIVE Each $40

DISK DRIVE CONTROLLERS

MAYNARD
All options available.
FDC (5¼")
FDC/SP (5¼" with Serial Port)
FDC/8 (8")
FDC/8 PP (8" with Parallel Port)
FROM $160

MAYNARD
Sandstar Series
Modular Controller Cards Call

COLOR/GRAPHICS CARDS

HERCULES
QUADRAM
PLANTRONICS
PARADISE SYSTEMS
AST MONOGRAPH PLUS
FROM $250

COMMUNICATIONS

AST RESEARCH
AST-3780
(3780 RJE bisync emulation) Call
AST-5251
(5251 remote emulation) Call

Special Xpress

TANDON 5¼" DISK DRIVE
TM 100-2 $199

64K RAM CHIPS $52
(Set of 9) 150 NS

64K RAM CHIPS $49
(Set of 9) 200 NS

I2BM-10P $1295
(10 Megabyte Hard Disk System)

DISK DRIVES

For your IBM PC or compatible.

5¼" FULL HEIGHT DISK DRIVES
TANDON TM 100-2
TANDON TM 101-4
CONTROL DATA 9409
FROM $199

5¼" HALF HEIGHT DISK DRIVES
TANDON 50-2
TANDON 55-4
CONTROL DATA 9428
QUME 142-A
TEAC 55B
TEAC 55F
FROM $180

8" THINLINE DISK DRIVES
TANDON TM 848-1E Call
TANDON TM 848-2E $325

8" THINLINE FLOPPY DISK SUBSYSTEM
Fully Assembled & Tested with Complete Documentation Cable and Software. IBM PC compatible.
I-8480 Dual Drive, Double Sided 2.4 MB $1495
I-8481 Single Drive, Double Sided 1.2 MB; incl. Filler Panel $995

MONITORS

AMDEK VIDEO 310A $175
12" Amber Monitor

PGS HX-12 ..... $470
12" Hi Res Color (RGB) Monitor

PGS SR-12 ..... Call
12" Super Res Color Monitor

MODEMS

HAYES
SMART MODEM 1200 ..... Call
SMART MODEM 1200B Call

TERMS: Prepayment, COD, Visa and MasterCard accepted. Add 2% shipping and handling on all orders. Add 3% surcharge for Visa and MasterCard.

Prices subject to change without notice. 20% restocking charge for all returned items.

FOR XPRESS SERVICE, PHONE
Toll Free 1-800-632-8515
California 1-714-632-8512
Hours: 8 AM - 5 PM Mon.-Fri.
For Customer Service Call 1-714-632-8996

WARRANTY: Microxpress honors all manufacturers warranties.

RETURNS: Call our Customer Service Department for an MRA (Material Return Authorization) Number for all in and out of warranty returns

CIRCLE 341 ON READER SERVICE CARD

PC NETWORK

BUY HARDWARE AND SOFTWARE AT WHOLESALE +8%, AND GET 12-21 DAY SOFTWARE RENTALS† . . .

Join the thousands of buyers who have saved more than $8,000,000.00 on over 25,000 orders in just the last six months.

The nation's largest corporations depend on PC NETWORK!

On our corporate roster are some of the nation's largest financial industrial and professional concerns including:

AT&T	*General Mills*
Barcleys Bank	*Harvard University*
Ball & Howell	*Hughes Aircraft*
Centel	*International Opinion Research Center*
Citibank	*Standard Oil of Ohio*
Columbia University	*University of Chicago*
Farm Bureau Insurance	*Veteran's Administration Hospitals*
Frontier Airlines	
GATX Corporation	

plus thousands of satisfied consulting firms, small businesses, computer clubs, user groups, municipalities, government agencies and valuewise individuals ACROSS THE NATION! Their buyers know that purchasing or renting from PC NETWORK saves them time, money and trouble. They also count on us for product evaluation, professional consultation and the broadest spectrum of products and brands around.

CALL TOLL FREE 1-800-621-S-A-V-E

In Illinois call (312) 280-0002

Your Membership Validation Number: A194

You can validate your membership number and, if you wish, place your first money-saving order over the phone by using your VISA, MASTERCARD or AMERICAN EXPRESS. Our knowledgeable service consultants are on duty Mon-Fri 8 AM to 7 PM, SAT 9 AM to 5 PM CST.

PERSONAL COMPUTER NETWORK
320 West Ohio
Chicago, Illinois 60610

Call now...Join the PC NETWORK and start saving today!

PC NETWORK • MEMBERSHIP APPLICATION

YES! Please enroll me as a member in the PC NETWORK™ and rush my catalog featuring thousands of computer products, all at just 8% above DEALER WHOLESALE PRICES. I will also periodically receive "THE PRINTOUT", a special up-date on merchandise at prices BELOW even those in my wholesale catalog, and all the other exclusive, money-saving services available to Members.

194 ☐

I am under no obligation to buy anything. My complete satisfaction is guaranteed. Please check (✔) all boxes that apply.

Basic Membership

- ☐ One-year membership for $8
- ☐ Two-year membership for $15 (SAVE $1)
- ☐ Business Software Rental Library for $25 add'l per year—with 12 day rentals
- ☐ Games Software Rental Library for $10 add'l per year

Special V.I.P. Membership*

- ☐ One-year membership for $15
- ☐ Two-year membership for $25 (SAVE $5)
- ☐ BOTH Business and Game Software Rental Libraries for $30 add'l per year—with 21 day rentals

*VIP members receive advance notice on limited quantity merchandise specials

☐ Bill my credit card ☐ VISA ☐ MasterCard ☐ American Express

Account Number _____

Exp Date _____ mo year

☐ Check or money order enclosed for $ _____

Name _____

Address _____ Apt No. _____

City _____ State _____ Zip _____

Telephone ( ) _____

Please provide the following information to insure compatibility with your system (check all boxes that apply):

☐ APPLE //e ☐ APPLE //c ☐ APPLE //+
☐ MACINTOSH ☐ LISA ☐ APPLE III
☐ Other: _____

Signature _____
(Signature required to validate membership)

Copyright ©1984, PC NETWORK INC

Listed below are just a few of the over 20,000 products available at our EVERYDAY LOW PRICES! All software below is priced in IBM-PC format.

GAMES & EDUCATIONAL SOFTWARE

(Please add $1 shipping and handling for each title ordered from below.)

	Wholesale
Avant-Garde *Air Traffic Controller*	$16.50*
Bluebush *Chess (Your Toughest Opponent)*	34.00*
Broderbund *Lode Runner*	16.75*
CBS *Goren-Bridge Made Easy*	46.00*
Epyx *Temple of Apshai*	21.97*
Infocom *Zork I, II, or III*	21.00*
Infocom *Deadline, Witness or Suspended*	27.00*
Microsoft *Flight Simulator*	27.00*
Orion *JBird (QBert Look Alike)*	32.00*
Orion *PCMan (Great Pac Man)*	21.00*
Scarborough *Mastertype*	27.00*
Screenplay *Asylum (works with mono card too)*	16.50*
Sierra On-Line *Frogger*	21.00*
Sierra On-Line *Crossfire*	18.00*
SubLogic *Night Mission Pinball*	24.00*
Spinnaker *Alphabet Zoo*	17.00*
Spinnaker *Delta Drawing*	29.00*
Spinnaker *FaceMaker*	20.00*
Spinnaker *Hey Diddle Diddle*	17.00*
Spinnaker *KinderComp*	17.00*
Spinnaker *Rhymes & Riddles*	17.00*
Spinnaker *Story Machine*	20.00*
Spinnaker *Most Amazing Thing*	23.00*
Virtual Combinatics *Micro Cookbook*	21.00*

BUSINESS SOFTWARE

(Please add $2.50 shipping and handling for each title ordered from below.)

ATI *How to use MultiMate*	$42.00*
ATI *How to use Microsoft Word*	42.00*
ATI *How to use Lotus 1-2-3*	42.00*
Ashton-Tate *DBASE III*	CALL
Ashton-Tate *Framework*	CALL
Ashton-Tate *Friday!*	158.00*
Central Point *Copy II PC*	23.00*
Conceptual Instruments *Desk Organizer*	150.00*
Digital Research *CP/M-86*	30.00*
Digital Research *DR Logo*	55.00*
Digital Research *PL/1 Compiler*	300.00*
Funk Software *Sideways*	36.00*
Harvard *Harvard Project Manager*	215.00*
Hayes *Smartcom II*	98.00*
Human Edge *The Management Edge*	146.00*
Human Edge *The Sales Edge*	146.00*
Lotus Development *Lotus 1-2-3*	CALL
MicroRim *RBase 4000*	300.00*
Microsoft *C Compiler*	275.00*
Microsoft *Word with Mouse—Latest Version*	255.00*
Microsoft *Multiplan*	105.00*
Monograre *Dollars & Sense*	95.00*
Oasis *The Word Plus*	90.00*
Rosesoft *Prokey Version 3*	74.00*
Satellite Software *WordPerfect*	210.00*
Softcraft *Fancy Fonts*	120.00*
Softstyle *SET-FX*	30.00*
Software Publishing *PFS: File*	76.00*
Software Publishing *PFS: Report*	39.00*
Software Publishing *PFS: Write*	76.00*
Software Publishing *PFS: Graph*	74.00*
Sorcim *Supercalc 3*	195.00*
SPI *Open Access*	339.00*
Verbatim *Disk Drive Analyzer*	35.00*

HARDWARE

(Please add shipping and handling charges found in italics next to price.)

COMPLETE SYSTEMS

Apple *Macintosh Base System*	1,810.00*	(30.10)
Apple *Apple //c*	CALL	
Apple *Apple //e*	CALL	
Columbia *Desktop & Portable Systems*	CALL	
Eagle *Desktop PC and Spirit Portables*	CALL	
IBM *PC 2 DSDD Floppy Drives/Color Card/Mono Monitor*	2,047.00*	(48.00)
IBM *Hard Disk 1 Floppy/10Mb Hard Disk/128K/Color Card/Mono Monitor*	2,802.00*	(52.00)
Sanyo *MBC 550 "Lowest Cost MS-DOS System"*	710.00*	(16.00)
Tava *Complete IBM compatable (128K/Color Card/Mono Mon/2 drives*	1,710.00*	(36.95)
Texas Instruments *Professional*	CALL	

DISK DRIVES & CONTROLLERS

Cogito *1/2 Ht Low Power 10MB Winchester W/IBM Controller*	930.00*	(16.00)
IBM *Floppy Disk Controller*	150.00*	(2.50)
Maynard *WS-1 10MB Internal Hard Disk with Sandstar Multi Function Card*	960.00*	(18.00)
Maynard *WS-2 same as WS-1 but with Sandstar Floppy Controller (uses 1 slot)*	960.00*	(20.75)
Maynard *Floppy Controller/Serial Port*	185.00*	(2.50)
Panasonic *Half Height DSDD Drive Pair*	300.00*	(6.92)
Qume *Half Height DSDD Drive Pair (Same as used on IBM Portable)*	300.00*	(7.00)
Tandon *TM100-2 Full Height DSDD Drive*	198.00*	(4.00)
Tallgrass *20MB External Hard Disk with Tape Backup*	2,500.00*	(46.20)
Teac *FD55-B Half Height DSDD Drive Pair*	300.00*	(7.00)

MEMORY CHIPS

All chips guaranteed for life

64K Memory Upgrade Kits (9 Chips)	43.20*	(1.00)
64K Dynamic Ram Chips (Each)	6.00*	(1.00)

MODEMS

Anchor *Mark XII LOWEST PRICE 1200BPS HAYES COMPATABLE EXTERNAL MODEM!*	230.00*	(2.00)
Hayes *Smartmodem 300*	130.00*	(2.00)
Hayes *Smartmodem 1200B with Smartcom II*	366.00*	(2.50)
Hayes *Smartmodem 1200B without software*	299.00*	(2.50)
Rixon *R212A Stand Alone 1200BPS*	335.00*	(8.50)
U.S. Robotics *Password (Compact 1200BPS External)*	298.00*	(6.50)

MONITORS

Amdek *Video 300G Composite Green*	110.00*	(3.00)
Amdek *Video 300A Composite Amber*	120.00*	(3.00)
Amdek *Video 310A IBM Type Amber*	130.00*	(3.00)
Amdek *Color II+ RGB Color*	362.00*	(2.00)
Princeton *HX-12 RGB Monitor*	CALL	
Princeton *MAX-12 IBM Mono*	CALL	
Princeton *SR-12 Ultra High Res RGB*	CALL	
Taxan *210 Combo RGB/Composite*	245.00*	(2.00)
Taxan *420 Super High Res RGB Monitor*	400.00*	(9.30)
Zenith *ZVM-123 Green High Res (Consumer Reports Rated Best Buy!)*	70.00*	(2.50)

MULTIFUNCTION CARDS

Apparat *512K Memory Board with OK*	35.00*	(2.50)
Apparat *Combo 6 w/ser/par/game/clock/sfwr*	123.00*	(2.50)
AST *Six-Pack Plus with OK*	209.00*	(2.50)
AST *MegaPlus II with OK*	205.00*	(2.50)
AST *I/O Plus 6*	139.00*	(2.50)
Quadram *Improved Quadboard 384K with OK*	197.00*	(2.50)
Tecmar *Captain Multifunction Card with O/K*	300.00*	(2.50)

PRINTERS

Conrex/Brother *CR-8 13CPS LQ Printer*	399.00*	(8.62)
Conrex/Brother *Typewriter Keyboard for CR-8*	150.00*	(3.25)
Conrex/Brother *Cut Sheet Feeder for CR-8*	180.00*	(3.88)
Epson *RX-80*	267.00*	(6.00)
Epson *FX-80*	415.00*	(9.25)
Epson *FX-100*	660.00*	(14.35)
Epson *LQ1500*	CALL	
Epson *IBM-M-EPSON Parallel Cable*	21.00*	(1.00)
NEC *2050 20CPS Letter Quality Printer*	765.00*	(18.53)
NEC *3550 33CPS Letter Quality Printer*	1,400.00*	(31.84)
Okidata *ML84P 200CPS 132 Col*	720.00*	(18.00)
Okidata *ML92P 160CPS 80 Col Printer*	395.00*	(8.58)
Okidata *ML93P 160CPS Wide Platen*	590.00*	(15.00)
Okidata *2410P Pacemark 350CPS 132 Col*	1,850.00*	(60.00)
Okidata *IBM-to-Okidata Parallel Cable*	29.75*	(1.00)
Qume *Sprint 11/45 45CPS Letter Quality*	1,155.00*	(24.00)
Qume *IBM Cable and Interface (required)*	72.00*	(1.00)
Texas Instruments *855 DP/LQ w/Tractor*	716.00*	(15.50)
Toshiba *P-1351 160/100 CPS Draft/LQ Printer*	1,200.00*	(32.00)

VIDEO CARDS

Amdek *MAI Card*	210.00*	(2.50)
Hercules *Monochrome Graphics Card*	300.00*	(2.50)
Hercules *Color Card with Parallel Port*	CALL	
Paradise *Multidisplay Card*	332.00*	(2.50)
Persyst *Monochrome Display Card*	206.00*	(2.50)
Quadram *Quadcolor I Color Card*	170.00*	(2.50)
Quadram *Quadvue Mono Card w/Ser/Par/Clock*	218.00*	(2.50)
STB *Graphix Plus*	360.00*	(2.50)
STB *Clock Option for Graphix Plus*	35.00*	(1.00)

ACCESSORIES AND SUPPLIES

Brand Name DSDD Diskettes *Guaranteed for Life!*	30.00*	(1.50)
Curtis *PC Pedestal II*	54.00*	(2.00)
Keytronic *KB5151 Deluxe IBM Keyboard*	186.00*	(4.00)
WP Printer Paper *2600 Sheets Microline Perfs (invisible when torn)*	17.00*	(10.00)

***PC NETWORK Members pay just 8% above the wholesale price, plus shipping.** All prices reflect a 3% cash discount. Wholesale prices fluctuate rapidly—all prices in this issue have been prepared 60 days in advance. Please call for latest prices. Minimum shipping 2.50 per order.

†**RENT BEFORE YOU BUY**—*Members are eligible to join The NETWORK's Business and Game Software Rental Libraries and evaluate products for a full 12 (Regular) or 21 (VIP) days to see if it meets your needs. And The NETWORK's rental charges are far less than other software rental services—JUST 20% OF THE MEMBER WHOLESALE PRICE.*

. . . AS A PC NETWORK MEMBER ONLY!

COMPLETE IBM™ PC SYSTEMS

IBM PC STARTER SYSTEM

IBM PC w/64K — **$2,047.00*** *(48.00)*

(256K System Board Capacity)

Floppy Drive Controller
2 Double Sided Double Density 320/360K Disk Drives
Quadram Quadcolor I Color Adapter Card
Zenith ZVM123 High Res Monochrome Monitor

REFLECTS IBM REDUCTION!

The NETWORK has the perfect starter system for you! The combination of double sided disk drives and a color card enable you to run ANY program—from games and educational software to the most sophisticated business applications.

IBM PC PROFESSIONAL HARD DISK SYSTEM (XT)

IBM PC w/128K — **$2,802.90*** *(62.00)*

(256K System Board Capacity)

1 Double Sided Double Density 320/360K Disk Drive
Quadram Quadcolor I Color Adapter Card
Zenith ZV123 High Res Monochrome Monitor

REFLECTS IBM REDUCTION!

w/Maynard Electronics WS-2 Hard Disk Subsystem:

Combination Floppy/Hard Disk Controller (Uses only 1 PC Slot)
Automatic Hard Disk Boot Feature
10Mb Hard Disk (1½ TIMES FASTER THAN IBM's)

This system increases productivity in any business or professional situation. The 10Mb hard disk eliminates cumbersome floppy disk changes, simplifies operations and dramatically speeds program execution time. The NETWORK's buying power provides you with better than XT performance at a price lower than you'd expect to pay for a standard PC.

*PC Network Members pay just 8% above this wholesale price plus shipping. These prices have been prepared in June, 1984 and may have been changed with new product announcements. Call for latest prices.

LATEST ISSUE REDUCTIONS!

As the NETWORK's volume grows our prices drop. The following popular products are now available at these new lower prices!

64K MEMORY EXPANSION KITS Set of 9 chips *Guaranteed for Life.*	**$ 43.20* set**
TANDON TM100-2 DRIVES	**168.00* ea.**
TEAC or PANASONIC 1/2 Height Disk Drives with Mounting Kit	**150.00* ea.**
AMDEK MONITORS	
V300G Composite Green	**110.00***
V300A Composite Amber	**120.00***
V310A IBM Amber	**130.00***
HERCULES CARD	**300.00***
HAYES 1200B Without Software	**299.00***
NEC 3550 33 CPS-Letter Quality Printer	**1,460.00***
HAYES SMARTCOM/II Communications Package	**68.00***
BRAND NAME DISKETTES DS/DD Box of 10 *Guaranteed for Life*	**20.00***

*NETWORK members pay just 8% above these wholesale prices plus shipping.

CALL TOLL FREE **1-800-621-S-A-V-E** (orders and membership only)
In Illinois call (312) 280-0002 validation code A194

PC NETWORK

. . . WITH THESE 15 UNIQUE BENEFITS

1 COST + 8% PRICING—The NETWORK purchases millions of dollars in merchandise each month. You benefit in receiving the lowest price available **and all at just 8% above published dealer wholesale price.**

2 OUR 400 PAGE WHOLESALE CATALOG—Members receive our 400 page wholesale catalog containing over 20,000 hardware and software products for the IBM PC, APPLE and over 50 other popular computer systems. THE NETWORK'S CATALOG IS THE LARGEST SINGLE COMPILATION OF PERSONAL COMPUTER PRODUCTS AVAILABLE TODAY—**ALL PRICED AT 8% above Dealer WHOLESALE.**

3 EXPERIENCED CONSULTANTS—The NETWORK hires consultants, not order takers, to aid you in product selection. Our consulting staff possess in excess of 150 man years of personal computer product experience. **We back our consultants with our money back guarantee: IF ANY PRODUCT RECOMMENDED BY OUR CONSULTING STAFF FAILS TO PERFORM AS PROMISED—OR IS INCOMPATIBLE WITH YOUR SYSTEM—WE WILL TAKE IT BACK AT OUR EXPENSE FOR A 100% REFUND.**

4 IN-STOCK INSURED FAST HOME DELIVERY—The NETWORK maintains a **giant multi-million dollar inventory of most popular products,** allowing us to ship many orders from stock. Non-stock items are typically maintained in local warehouses just days away from The NETWORK and YOU. We pay all insurance expenses on your shipment. EMERGENCY OVERNIGHT SERVICE IS AVAILABLE ON REQUEST.

5 FREE TECHNICAL SUPPORT—The NETWORK supports every product it sells. We maintain a qualified TECH-SUPPORT staff to help you assemble your system, interpret vendor documentation and get your software and hardware to work. **WE WILL GIVE YOU ALL THE HELP YOU NEED, WHEN YOU NEED IT—FREE!**

†**6 OPTIONAL BUSINESS RENTAL LIBRARY**—All members can join our BUSINESS RENTAL LIBRARY for just $25 PER YEAR above the base membership fee. **This entitles you to rent business software AT JUST 20% of the DISCOUNTED PRICE FOR A 12 DAY PERIOD. If you decide to keep the software, the entire rental fee is deducted from the purchase price. VIP MEMBERS GET A FULL 21 DAYS for just $30 above the V.I.P. base fee. This also includes the game library privileges for a $5 combination savings.**

†**7 OPTIONAL GAME SOFTWARE RENTAL LIBRARY**—This Game Rental library is available to members for just $10 PER YEAR and permits evaluation (or just enjoyment) of any game or educational software product as above.

8 SPECIAL SAVINGS BULLETINS—THE PRINTOUT—The NETWORK seeks every opportunity to save money for its members. We buy excess dealer inventories, and store bankruptcy closeouts regularly. We then turn around and make this merchandise (only top quality name brand products) available to our members at fantastic savings via THE PRINTOUT, our newsletter and savings bulletins.

9 DISCOUNT BOOK LIBRARY—Working with numerous publishers and distributors, The NETWORK has assembled a library of over 1000 computer related books and manuals at savings of up to 75% from the normal store prics.

10 MEMBERSHIP REFERRAL BONUS—Our most valuable source of new members is you! To date almost 40% of our members have been referred by word of mouth from other satisfied members. For those of you who refer new members, The NETWORK will credit a cash bonus to your account applicable to any future purchase.

11 CORPORATE ACCOUNT PROGRAM—Almost 50% of The NETWORK's members are corporate buyers and users *(see opposite page left).* The NETWORK can establish open account (P/O) status and assign designated account managers to expedite orders, and coordinate multiple location shipments.

12 QUANTITY DISCOUNTS—For large corporations, clubs, and repeat or quantity buyers The NETWORK can extend additional single order discounts, when available to us from our manufacturers and distributors. **The NETWORK looks for every opportunity to save you money.**

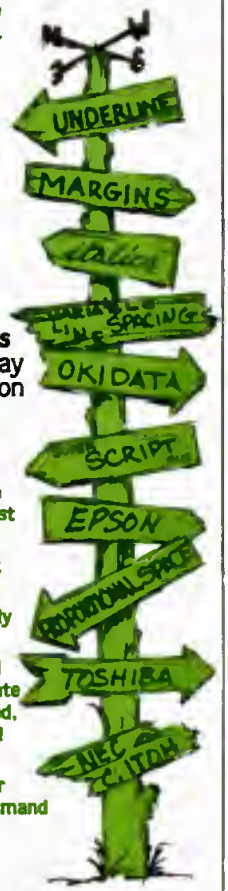
13 SOFTWARE PUBLISHING ASSISTANCE—The NETWORK reaches tens of thousands of members regularly through its catalog and newsletter. For those of you who have created marketable software we will lend you our clout with our members, software publishers and distributors to get your material evaluated and circulated.

14 MEMBERSHIP SATISFACTION GUARANTEE If for any reason you are not satisfied with your membership within 30 days, we will refund your dues IN FULL.

15 PRODUCT SATISFACTION GUARANTEE **If your are not satisfied, for any reason with any hardware component purchased from The NETWORK within 10 days of receipt, we will refund your entire purchase (less shipping) with no questions asked.**

CIRCLE 535 ON READER SERVICE CARD

PrintMan™ will guide you



Quickly use the full capabilities of your printer without programming or looking up control codes. With **PrintMan's** full-screen display and pop-up action menus, you can effortlessly:

- Set printer commands from a full-screen checklist
- Save selected commands to disk for later use
- Combine previously saved commands
- Intermix text and commands to create personal letterhead, page headings and footings
- Get online help for every printer command

Save time and effort with **PrintMan's** extensive tutorials for the novice, sophisticated techniques for the professional. $59 for one printer model of your choice — $15 for each additional model.

800-522-0290
(ORDERS ONLY)

QUALITY PROGRAMMING TOOLS

QUALITAS™

Qualitas, Inc.
P.O. Box 3AK, UPB
Las Cruces, NM 88003
505-522-0290

For the IBM® PC or XT, supports all printers — specify make and model number when ordering — requires 192K, 80 column screen, S-S drive — compatible with PCDOS 1.10, 2.00, 2.10 — compatible with most spreadsheets and word processors. Next day shipping on VISA/MC orders — price includes all domestic shipping and handling — no extra charge for VISA/MC — MD & NM residents add sales tax.

CIRCLE 353 ON READER SERVICE CARD

tions for the IBM PC—including home budget managers, general ledgers, manufacturing systems, and other applications in the world of commercial data processing—nothing can touch Business BASIC,

For applications in commercial data processing, nothing can touch Business BASIC—not even the best implementations of COBOL.

not even the best implementations of COBOL.

Let's look at Applications BASIC and Thoroughbred BASIC in turn.

Soft Gold's Applications BASIC

Soft Gold is a new company. Applications BASIC—or AB86, as Soft Gold labels it—is the brainchild of Dick Wallman, who has been working on Business BASIC products ever since Basic Four developed the language in the late sixties. He previously had written versions for other companies, and his years of experience writing BASIC interpreters shows in this one. Applications BASIC is a very small (about 22K) and very efficient product. It has many little features that professional programmers appreciate.

Applications BASIC was written in an impressively short time, but it is a full BBIII-compatible implementation. (BBIII is a version of Basic Four's product; its features are to Business BASIC what Level II is to COBOL.)

Applications BASIC is designed to run under MS-DOS. In fact, it may be the most MS-DOS-compatible product I have ever seen. It does not cheat. It never yields to the temptation to use the IBM ROM BIOS. The ROM BIOS is a very powerful, but machine-dependent, set of routines. MS-DOS has routines that hide these dependencies. If you stick to MS-DOS routines, your software will run as well on a Texas Instruments PC or a DEC Rainbow as on an IBM PC. AB86 does a very good job here. The only place it deviates is with some standard Business BASIC screen control commands (for example, CF, which clears only the high intensity portions of a screen) because they cannot be duplicated using MS-DOS. But the deviation is minor because AB86 contains a word with the address of the screen memory. Moving to another machine basically takes a one-word patch and some fiddling around to accommodate the MS-DOS inconsistencies. Since AB86 uses only MS-DOS calls, it is very transportable and can use features such as device drivers. Applications BASIC in fact requires MS-DOS 2.0 or higher since it uses the ANSI.SYS device driver for screen output. Even so, I stuck the diskette I had into a Texas Instruments PC under MS-DOS 1.25 and had no trouble bringing up Applications BASIC. It worked fine except for some screen output functions that required knowledge of where the CRT's memory is. I liked this very much.

Its device drivers were designed with transportability in mind. For example, if you print ESCape [20;20H using ANSI.SYS, you position the cursor to row 20, column 20 regardless of whether your program is running on an IBM PC, TI PC, or DEC Rainbow.

Between the Covers

The manual I had was preliminary. It was produced on a word processor and photocopied. A new version, in the standard IBM-size format with slipcase, has since been produced. My one big complaint was that only a couple of short utilities were included. This can be a hindrance to the inexperienced and makes programming that much more difficult. The version I tested was not 100 percent bug free, but it worked extremely well.

Any bugs I found have since been corrected.

Applications BASIC has several other nice features that I should also mention. There are instructions called GET and PUT that read disk sectors, which makes disk I/O very fast. GETting sector 0 returns the boot record. Writing utilities to work with the disk—to do such things as unerase a file or rebuild a file—is child's play. I wrote a nice disk hex dump program in about 20 lines of code! Applications BASIC can also read and write to any MS-DOS file. For instance, I could open a *WordStar* file in a BASIC program and simply read it in. AB86 also allows you to have up to 63 files open at once. This is very convenient when writing a tightly integrated application that must do a lot of validation of data entry.

All in all, Applications BASIC epitomizes what is good about a small software house. It is well written, small, and fast (considering it uses MS-DOS calls) and was produced quickly. It is being improved rapidly, and the authors are willing to listen to suggestions for enhancing it. Applications BASIC is also very easy

> Applications BASIC may be the most MS-DOS-compatible product I have ever seen.

to use. It does not suffer from an accumulation of elaborate features that require equally elaborate documentation. All you need to do is stick in the program diskette, type AB86, and you're in business.

I should also mention that Soft Gold also has a CP/M-80 version that is virtually identical to the MS-DOS version. You can move your code to a good old CP/M machine (even a Commodore 64), and it will still run fine (unless you have written some MS-DOS utilities). In this day and age, it's unusual to see a product

NOW YOU CAN WORK IN C WITH ONLY BASIC KNOWLEDGE

Enjoy the Best of Both Worlds with BASIC_C™!

Until now, IBM BASIC and C were about as far apart as apples and oranges — and if you wanted to move from BASIC to C, you had to go back to square one. Not anymore!

There's no denying that BASIC is a fine language: It has probably helped you learn alot about programming computers. But now that you know how to program, isn't it time to take the next step — to a language that was designed to help you quickly develop software that is fast, compact, and portable?

BASIC_C can help you make the transition smoothly: It's a library of C functions providing BASIC's high level capabilities you've come to know so well. Functions for string handling, sequential and random I/o, graphics, and many more — all designed to look and work like BASIC.

You get the source code to BASIC_C: extensively documented. It provides many examples to help you learn how to write C functions, and if a function doesn't suit your specific needs . . . change it!

C Source provides a complete development package: the BASIC_C Library, a full screen editor, and a choice of two C compilers. Buy it all, or just the pieces you need.

BASIC_C Library - source code	$175
EC - full screen editor	$ 85
BASIC_C & EC	$225
BASIC_C & DeSmet C Compiler	$275
BASIC_C & Computer Innovstions C compiler	$475
BASIC_C, DeSmet C Compiler, & EC	$325
BASIC_C, Computer Innovations C compiler, & EC	$525

Write or Call Collect

SOURCE
C-Source
12801 Frost Rd.
Kansas City, MO 64138
816-353-8808

CIRCLE 371 ON READER SERVICE CARD

CIRCLE 298 ON READER SERVICE CARD

PSYCHE™
THE COMPUTER COUNSELOR

ARTIFICIAL INTELLIGENCE. PSYCHE is a modern software simulation of a Rogerian counselor who will hold a delightfully real keyboard conversation with you on over 50 subjects including marriage, sex and work. You may type anything you wish. PSYCHE analyzes your remarks and creates responses that are reflective, non-directive and nonjudgmental. PSYCHE usually stays with your feelings like a real therapist, has unlimited time and patience, and never judges you or hands out advice.

REALISTIC. Thanks to 1984 techniques, responses are grammatical, lively and on the subject. You soon catch yourself thinking of PSYCHE as a real person.

ENJOYABLE. Tell PSYCHE anything. PSYCHE always listens and never gossips. And PSYCHE really shows off your computer, even greeting your friends by name.

NOT A GAME. A state-of-the-art fullscale simulation with over 156K program and files, PSYCHE knows over 1,500 key words and responses.

TEACH PSYCHE MORE. Comprehensive menus let you easily improve both vocabulary and responses, or add whole new subjects, without programming. PSYCHE even lists unrecognized words so you can add them. Conversations can be saved and printed. Includes 12 page manual.

FOR ALL IBM PC COMPATIBLE COMPUTERS USING DOS 1.1 WITH 64K, DOS 2.0 WITH 96K, OR DOS 2.1 WITH 128K. DISK 80 CHAR. DISP.

ONLY $49.50

CALL NOW AND WE'LL SEND IT tST CLASS TODAY
Shipping $2.50. Florida Res. add 5% Tax
PHONE OR MAIL. VISA, MCARD OR CHECK
• • • 305 - 391-4610 • • • 305 - 395-6552 • • •
A Professional Version is also available to Licensed Therapists. Copyright 1984

BALIS COMPUTING, INC.
PO Box 273261, Boca Raton, FL 33427

CIRCLE 142 ON READER SERVICE CARD

that is developed on a 16-bit machine and then moved to an 8-bit one.

Soft Gold will be introducing a compiled Business BASIC (the first one ever) by the end of this year and plans to add new features, such as 120-character variable names. The company is also looking into graphics. (By the way, Soft Gold's Applications BASIC will also run perfectly on an IBM PC*jr* with 128K and one floppy and DOS 2.1. It also runs on the DEC Rainbow, TI PC, and almost any PC workalike.)

Your PC and Compucart: Smart!

You own a personal computer, or you are planning to buy one. Smart!

Once you have seen the COMPUCART and studied our technical drawings, you will understand why it has become popular among major corporate executives and why it is the Smart place to put your PC.

ONLY COMPUCART:

- Holds a complete PC system, including 132 column printer, manuals, software, and still has room for expansion in a space approximately 2 feet square
- Adjusts horizontally and vertically to suit your individual needs
- Cools your PC and quiets your printer
- Rolls easily wherever you need it, and
- Locks securely with your own key.

Compucart makes learning and using your PC easier, and more productive. You can work Smarter with:

COMPUCART, "The SMART CART"!

COMPU-CART® Pat. Pend.

Call Toll Free 1-800-237-9024

Manufactured by Versa Tec Corporation

P.O. Box 2095, Tampa, FL 33609-2095 Telephone (813) 251-2431

Dealer Inquiries Invited

CIRCLE 199 ON READER SERVICE CARD

SMC's Thoroughbred BASIC

SMC's entry in the race, Thoroughbred BASIC, is a fine example of a product produced by a much larger company. SMC is a large (large like Microsoft, not large like IBM) software house that has been writing Business BASIC interpreters and other Business BASIC products for some years. SMC's approach to Business BASIC on the IBM PC was drastically different from Soft Gold's. Instead of writing a language to run under MS-DOS, the company took the view that the PC-XT is fully capable of being a multi-user small business system. To achieve this, SMC wrote an entire operating system, Thoroughbred/OS (T/OS), that supports two additional stations on a PC-XT. You *can* run the system on a regular PC, but it is of little value because floppies can support only primitive utilities with T/OS. It is really intended for a PC-XT. Watching three users work on the same diskette simultaneously is a sight to behold. T/OS supports only one language—SMC's Thoroughbred BASIC. In fact, you talk to the operating system using BASIC commands. As a concession, the Thoroughbred Operating System allows an MS-DOS partition on the PC-XT's fixed drive, but basically the company has transplanted its product down to the PC.

Thoroughbred BASIC is consistent with SMC's other versions of BASIC. It also is a BBIII-compatible product. Clearly it is directed at business users with PCs who are looking for SMC's BASIC or who wish to run multiple stations.

The documentation is extremely professional in layout. It is much better than IBM's, in both appearance and readability. Even a novice user can install T/OS using the manual's step-by-step instructions. I might point out that while a small company usually cannot match the

quality of this presentation, it is also unlikely to commit the occasional howler of an error in the documentation such as SMC has in its Thoroughbred BASIC manual. For instance, to add on a second terminal you must tell T/OS what type of terminal it is. A table of CRT types is conveniently provided. This would be nice, but the table contains only a list of numbers, and nowhere is it explained what 0950 or 0300 or 8000 means! The product still needs some work to clean out these errors and the occasional program bug, such as this one: You can allocate your T/OS partition without any trouble, but the utility provided for it cannot reallocate the partition!

> SMC's implementation supports "ghost tasks," which allow you to run more than three tasks at once.

In fairness, though, SMC's Basic works very well. I found no bugs in the actual BASIC. SMC also provides a very large array of utilities, which are very useful for programmers and end users alike.

SMC's implementation also has other useful features. It supports "ghost tasks" (jobs that do not interact with the terminals). This allows you to run more than three tasks at once. For instance, printing a report is a good way to use ghost tasking (sometimes called background tasking). SMC's BASIC also supports exponentiation and floating-point arithmetic, but it allows only 15 files to be open at once. It has a utility to allow the user to define new mnemonics (for example, defining YN to display "Enter (Y)es or (N)o" to make programs more readable).

SMC's BASIC will currently run only on the PC-XT or a very compatible unit. The company is adding support for foreign hard disks and a streaming tape backup. It has also introduced an MS-DOS version (too late, unfortunately, for this review). SMC has a product for doing color graphics on a color graphics CRT (*not* a color

Look Again.

SMARTERM™ DOES IT!

You may have just bought your last DEC™ or DASHER™ terminal. Now, with our SMARTERM software you can turn an ordinary IBM® PC into a D100, D200 or D400 terminal. Or, choose VT100, VT102 or VT52 capability. And, what's more, you get powerful ASCII and binary file transfer, including an "error-free' mode.

SMARTERM features include full keyboard emulation, multiple setup configurations, "smart" softkeys and command files, 75 to 9600 baud operation, online help screens and full printer support.

With each order you'll get a complete user manual, reference card and keytop chart.

Hard to believe? Try it!

If you're not satisfied, return it within 30 days for a full refund. Call us NOW for more information.

Ask About Versions For PCjr.

Available through your local software dealer or directly from:

Persoft Inc.

2740 Ski Lane
Madison, WI 53713
(608) 273-6000 TELEX 759491

Software for Professionals... by Professionals.

*On your monochrome monitor using the UltraPAK or new SuperVision™ board! Ask about our special board prices, as well as other 132 column board support.

SMARTERM is a trademark of Persoft, Inc. • DEC & VT are trademarks of Digital Equipment Corp. • Dasher is a trademark of Data General Corp • IBM is a trademark of International Business Machines, Inc. • UltraPAK is a trademark of TSENG Laboratories, Inc. • SuperVision is a trademark of California Computer Systems, Inc.

CIRCLE 365 ON READER SERVICE CARD

In Software we're the *logical* choice!

LOGICSOFT

A MEMBER OF THE LOGIC GROUP

LOGICSOFT is a Reg T M of Logicsoft, Inc

Continental U.S.

1-800-645-3491

300 Garden City Plaza,
Garden City, New York 11530

New York State 516-741-0043
Canada 416-283-2354
Int'l. Telex ... 230199 Swift UR LGS
Dom. Telex . 960127 Swift NYK LGS

VISA

NO SURCHARGE FOR CREDIT CARDS
Purchase orders accepted by qualified institutions
Add 2% for shipping and handling ☐COD ☐Check ☐Money Order ☐NYS residents add sales tax

MasterCard

TEAR and COMPARE

Use this card to Shop the magazines

SEE REVERSE SIDE FOR ACCOUNTING SYSTEMS

WORD PROCESSING

Multimate	$275
Microsoft Word with Mouse	$295
Wordperfect	$319
Wordstar Pro Pak	$365
WORDSTAR	**$235**
Peachtext 5000	$195
Wordplus-PC	$285
Volkswriter Deluxe	$175
Edix & Wordix	$255
Easywriter II/Speller/Mailer	$195
Finalword	$189
Think Tank	$159

SPREADSHEETS/GRAPHICS

Multiplan	$155
Supercalc³	$239
Framework	(lowest price!)
TK! Solver	$285
LOTUS 1-2-3	**$309**
Context MBA	$489
T/Maker III	$199
Open Access	$389
Jack 2	$359
Super Chartman II & IV	$349
BPS Graphics	$289
Fast Graphs	$185

DATA BASE/FINANCIAL

Quickcode	$169
Knowledgeman	$275
TIM IV	$269
R Base 4000 (Microrim)	$325
dBASE II	**$375**
Condor III	$359
Friday	$175
Data Base Manager II (Alpha)	$195
Infostar	$255
DataPath	(lowest price!)
Dow Jones	(lowest price!)
Financier II	$115

LANGUAGES/UTILITIES

Concurrent CP/M86 (Digital Research)	$205
Pascal MT+ (Digital Research)	$235
PL/1 (Digital Research)	$479
Display Manager (Digital Research)	$359
Lattice C Compiler (Lifeboat)	**$325**
MS Cobol 86 (Digital Research)	$479
Pascal Compiler (Microsoft)	$245
C Compiler (Microsoft)	$325
Basic Compiler (Microsoft)	$245
Cobol Compiler (Microsoft)	$459
Business Basic (Microsoft)	$369
Fortran Compiler (Microsoft)	$245
Prokey 3.0	$95
Norton Utilities	$59
C-Food Smorgasbord	$119

LOGICSOFT

A MEMBER OF THE LOGIC GROUP

LOWEST PRICE GUARANTEE

WE'LL BEAT ANY PRICE BY $10 AND THANK YOU FOR THE PRIVILEGE

Tell us the advertiser and price for any IBM-PC software package advertised in a current issue of any popular computer publication and we'll beat that price by $10. This offer does not apply to those packages whose advertised price is under $100 or where LOGICSOFT's price is already the lowest!

WE OFFER OVER 400 OTHER TITLES

Prices subject to change without notice

TEAR AND SAVE

CLIP AND SAVE OUR CARD FOR YOUR FILE

VISA MasterCard

NO SURCHARGE FOR CREDIT CARDS

Purchase orders accepted by qualified institutions.

Add 2% for shipping and handling ☐COD ☐Check ☐Money Order

☐NYS residents add sales tax

1-800-645-3491

New York State 516-741-0043
Canada 416-283-2354
Int'l. Telex . . 230199 Swift UR LGS
Dom. Telex . 960127 Swift NYK LGS

LOGICSOFT

A MEMBER OF THE LOGIC GROUP

300 Garden City Plaza, Garden City, NY 11530

Continental U.S.

1-800-645-3491

LOGICSOFT is a Reg. T.M. of Logicsoft, Inc.

New York State 516-741-0043
Canada 416 283 2354
Int'l Telex 230199 Swift UR LGS
Dom Telex 960127 Swift NYK LGS

Looking for an
Accounting System?

CALL US...
WE'VE EVALUATED OVER 50 OF THEM

See our ad in *Journal of Accountancy*

TOLL FREE CONSULT
TOLL FREE SUPPORT
LOWEST PRICE GUARANTEED

INFORMATION UNLIMITED SOFTWARE (IUS)

general ledger	$295
accounts payable	295
accounts receivable	295
payroll	375
inventory	295
order entry	295
financial series (G/L, A/P, A/R)	859

STATE OF THE ART

general ledger	$479
accounts payable	479
accounts receivable	479
payroll	479
inventory	399
sales invoicing	399
time keeping and billing	679

PEACHTREE SERIES 8

general ledger	$375
accounts payable	375
accounts receivable	375
payroll	375
inventory	375
sales invoicing	375
job costing	375

SOLOMON SERIES III

general ledger (client writeup)	$479
accounts payable	479
accounts receivable	479
payroll	479
inventory	479
order entry/invoicing	479
purchasing	479
job costing	799

GREAT PLAINS SOFTWARE

general ledger	$479
accounts payable	479
accounts receivable	479
payroll	479
inventory	479

MBSI (Realworld)

general ledger	$575
accounts payable	575
accounts receivable	575
payroll	575
order entry/inventory	575
sales analysis	289

OPEN SYSTEMS

general ledger	$559
accounts payable	559
accounts receivable	559
payroll	559
inventory	559
sales order processing	559
purchase order processing	559
job costing	559

THE BUSINESS LIBRARIES

general ledger	$459
accounts payable	459
accounts receivable	459
payroll	459
inventory control	549
sales order entry	549
purchase order tracking	549
profit planner	549
the librarian	149

TCS

client write up	$1060

A LOGICSOFT
EXCLUSIVE
CUSTOM THERMOGRAVED
(RAISED LETTERS)
CONTINUOUS STATIONERY

CHOICE OF STOCK DESIGNS OR WE CAN REPRODUCE YOUR LOGO OR ARTWORK
CALL FOR YOUR **FREE KIT** TODAY!

LOGICSOFT
A MEMBER OF THE LOGIC GROUP

We're known by the companies we keep

- ASHTON - TATE
- DIGITAL RESEARCH
- DOW JONES
- INNOVATIVE SOFTWARE
- IUS
- FOX and GELLER
- LIFETREE
- LOTUS
- MICRORIM
- MICROSOFT
- PEACHTREE
- SATELLITE SOFTWARE
- SOFTWARE ARTS
- SOFTWORD SYSTEMS
- SORCIM
- AND OVER 100 OTHER PUBLISHERS

- the Logical Choice!

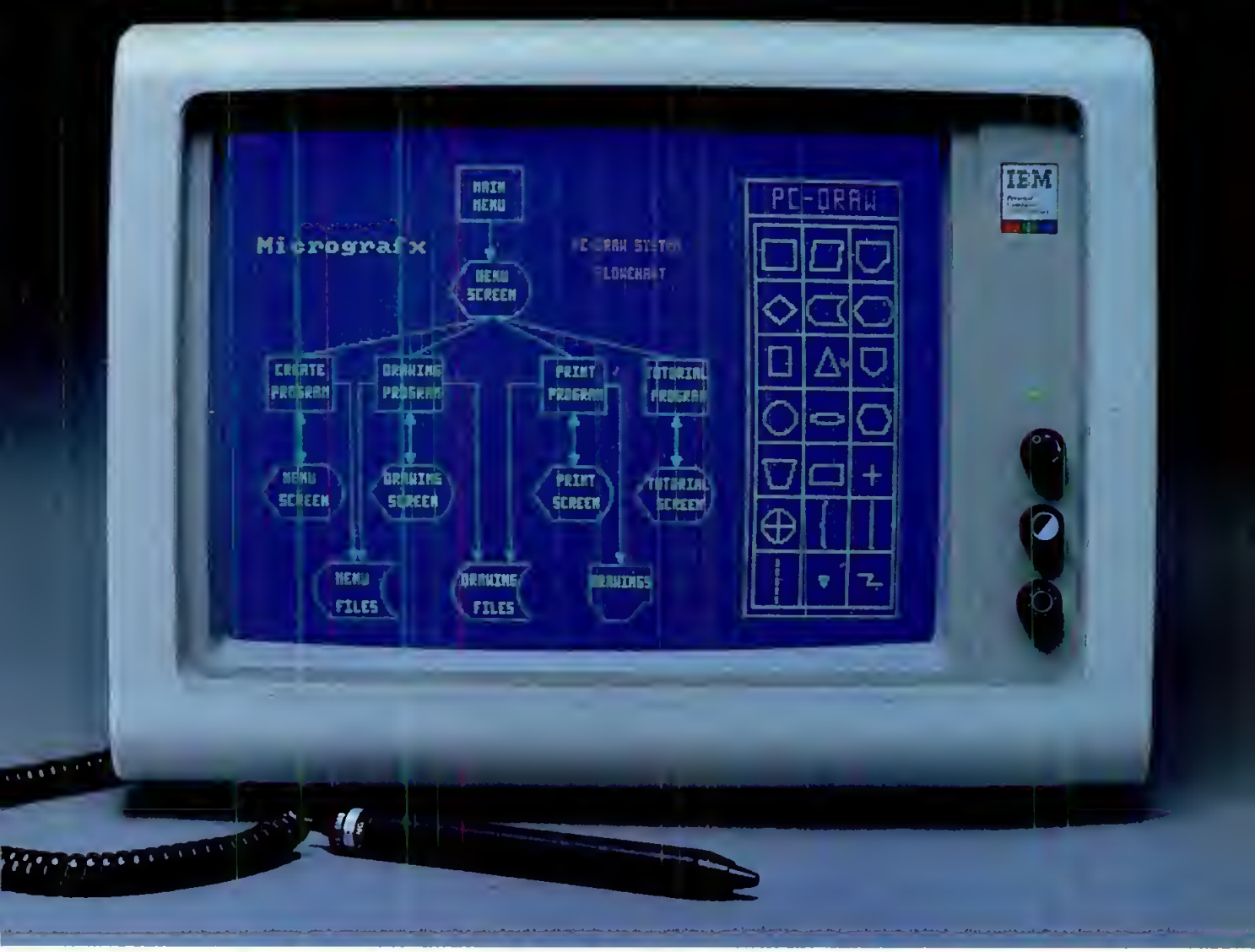
LOGICSOFT is a Reg. T.M. of Logicsoft, Inc.

NO SURCHARGE FOR CREDIT CARDS

VISA MasterCard

Continental U.S.
1-800-645-3491
300 Garden City Plaza, Garden City, NY 11530

New York State 516-741-0043
Canada 416-283-2354
Int'l. Telex .. 230199 Swift UR LGS
Dom. Telex 960127 Swift NYK LGS



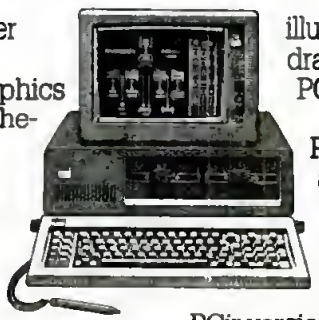
PC-Draw from Micrografx, the drawing system for your office or home.

Now, you can create diagrams, illustrations, charts and drawings on the IBM PC or XT.™

And reproduce them all with your printer or plotter.

With this versatile, easy-to-use graphics program, you can produce diagrams, schematics, charts and drawings in virtually limitless varieties.

PC-Draw provides you with three symbol libraries (software design, electrical design, and alternate text), multiple text fonts and the capability to design your own symbols, with an extensive set of graphic functions provided for symbol manipulation. These functions include object scaling, rotation and placement. PC-Draw lets you unleash your creative energies in data processing design, floor plans and interior design, graphic illustrations, electrical design, and other drawing/drafting applications. And PC-Draw supports an optional light pen.



The PC-Draw system requires an IBM PC or XT™ with graphics monitor, graphics adapter, 128K of RAM and two diskette drives or one diskette drive and a hard disk.

PC-Draw: $395 (includes HP7470A / 7475A Plotter Support). Light Pen: $195. PCjr version: $195. Plotters and graphics boards at competitive prices. To order or for information call (214) 234-1769 or write Micrografx.

MICROGRAFX INC.

1701 N. Greenville Ave., Suite 703/Richardson, TX 75081

© 1984 Micrografx

CIRCLE 161 ON READER SERVICE CARD

monitor) attached as a second terminal to the PC and is looking into adding graphics capabilities for use with a regular color monitor.

Decisions, Decisions

Well, by now you may be ready to run out and buy one of these products. The question is, which one should you buy? My suggestion is this: If you want to program in Business BASIC, buy Soft Gold's Applications BASIC. It runs under MS-DOS and is a very nice way to learn how to use Business BASIC—not to mention that it's the cheapest way.

SMC's Thoroughbred/OS and Thoroughbred BASIC are really for businesses that need multiple stations on a PC or need customized software. SMC also sells a full line of accounting packages and a database manager, *IDOL*. Many OEMs and dealers have also developed products that run

> SMC's product is really for businesses that need multiple stations on a PC or need customized software.

under SMC's Thoroughbred BASIC for specific types of businesses. The best part of all this is that you are getting source code for all these products. If your business needs custom software or wishes to make alterations to a package, this is wonderful. No need to gripe, just get a programmer or programming firm to alter the basic package for you. Because so much more software is available under SMC's Thoroughbred BASIC, it is the one I would recommend to a business or business people interested in doing their own programming.

I can heartily recommend both products, depending on your needs. If you want to learn Business BASIC or do any nongraphic application, try Applications BASIC. If you want to treat your PC-XT as a serious business machine, give SMC a call. Either way, you'll be introduced to the merits of the granddaddy of all BASICs in common use today, and one that is undoubtedly the most pleasant programming language for the average user. ■

Beyond Board-Driven Networks

MultiLink™ is a unique networking system which *doesn't* require costly "Network Interface Boards." Instead, it transforms ONE IBM PC/XT® (or compatible) into the CPU of a multi-tasking, multi-user network.

Four Workstations for the Price of One . . . with a *Software-Driven* Network. With MultiLink™, you can utilize up to eight inexpensive terminals as workstations. Four of these terminals cost less than one PC.

MultiLink™ runs under all releases of PC-DOS™ (except 1.0) and certain implementations of MS-DOS®. A wide range of leading programs which include WordStar®, Lotus 1-2-3™, Peachtext 5000™, and dBASE II® are fully supported.

A Resource-Sharing System. Multiple users are able to access all of your computer's resources, locally, or from remote locations using a terminal with a modem. Features include disk, file, and program-sharing; a dial-in bulletin board, and a comprehensive print spooler.

Make the MultiLink™ Connection Today. Call The Software Link TODAY, and get the whole story. MultiLink™ is immediately available for $295 and comes with a money-back guarantee. VISA, MC, and AMEX accepted.

MultiLink™

THE SOFTWARE LINK, INC.

8601 Dunwoody Place, Suite 336, Atlanta, GA 30338 Telex: 4996147 SWLINK

CALL: 404/255-1254

Dealer Inquiries Invited

CIRCLE 393 ON READER SERVICE CARD

THE BASIC For Professionals

BASIC has been around longer than the microcomputer. Countless people have learned the fundamentals of computer programming using this language, and a good percentage of this population has never moved up or away from it.

Over the years, BASIC has been modified and improved to the point where many fairly sophisticated and successful systems have been written entirely in this language. Recently, several new versions of this language have been introduced. One of the most significant is a product called Professional BASIC, from Morgan Computing, of Dallas, Texas.

In spite of its longevity, BASIC has been criticized by many authorities as an ineffective and perhaps dangerous programming language. Some believe that learning to program in BASIC will prevent you from becoming an effective programmer because this language encourages poor programming habits.

While this view is certainly harsh, BASIC does have several design flaws that inhibit or prevent the use of proper program structure and style.

Although IBM PC BASIC is a great improvement over the original version, it still has many deficiencies. It suffers from a number of problems:

- Procedures are numbered, rather than named;
- Program size is restricted to a maximum of 64K;
- Several verbs, which would improve the overall structure of the programs written in the language, are missing;
- The mechanism used to implement subroutine calls is limited in scope and slow in execution;
- The number, type, and precision of the available data structures are limited;
- Program testing support is primitive;
- Program execution is relatively slow.

Morgan Computing's implementation of BASIC adds a strong set of visual programming and debugging tools to this old and somewhat limited language.

Let's take a look at how Professional BASIC (hereafter PBASIC) meets these deficiencies. PBASIC is a logical subset of IBM PC BASIC (which Microsoft also markets as GWBASIC). Almost all the features found in IBM PC BASIC are included in the PBASIC product. With a few exceptions, systems written in IBM's version of the language should run under PBASIC.

In writing this updated version, Neil Bennett, the program's author, has incorporated a level of visual support unprecedented in both mainframe and microcomputer environments. To explain, I'll divide the features of PBASIC into the following categories: improved program environment support; new immediate commands; new visualization and debugging screens incorporated into the language.

Improvements

Morgan's implementation of the language allows BASIC programs to use all available memory. Theoretically, with the

appropriate hardware boards, you could write programs that use up to 640K. Practically speaking, this means that a program can take advantage of features like huge data tables, which are needed to solve certain problems. PBASIC fully integrates Intel's 8087 Numeric Data Processor (NDP), a device designed to perform floating-point math operations. The NDP performs these functions precisely and quickly. Unfortunately, the first release of PBASIC requires the 8087. The vendor promises that this is only a short-term restriction and that the next release will work with or without an 8087 chip.

With IBM PC BASIC you can use variable names of up to 40 characters long, whereas PBASIC allows names up to 320 characters. Although this capacity is greater, the feature is impractical. More important is PBASIC's support of named procedures. Like a variable name, a procedure name may be up to 320 characters long and may be used as the object of a GOTO or GOSUB verb just like a line number. Line numbers still are used and required for each line of PBASIC code. Consider the following coding example:

```
10 Main.processing.rtn;
20 GOSUB init.pgm.variables
30 GOSUB build.menu.screen
40 IF PGM.EOF
   THEN GOTO term.pgm
```

In the example above, the programmer could refer to the first line as Line 10 or by using the procedure name such as GOTO Main.processing.rtn;. PBASIC ignores capitalization but doesn't force variables into uppercase like IBM PC BASIC does. For example, main.rtn and MAIN.rtn are treated as the same name.

Another PBASIC improvement and one that is becoming increasingly popular with language developers is the use of semi or incremental compilers. Pascal has

Professional BASIC, Version 1.0
Morgan Computing Company, Inc.
10400 North Central Expressway,
#210
Dallas, TX 75231
(214) 739-5895
List Price: $345
Requires: 256K RAM, one double-sided disk drive, 8087 coprocessor.

CIRCLE 794 ON READER SERVICE CARD

LePrint™
Letter Quality for your Dot-Matrix Printer

IBM PC
WordStar
Edition

LePrint takes advantage of the graphics capability of your dot-matrix printer to produce high quality print rivaling a daisy-wheel printer.

Like a daisy-wheel, LePrint gives you a variety of type faces such as Courier and Prestige Elite, but without the bother of changing print wheels. You can easily change type faces on the same page or even mix faces on the same line!

Like an expensive typesetter, LePrint brings you letter sizes from under 1/12 inch (this size) to over 10 inches high. LePrint produces beautiful, proportionally-spaced and justified text with type faces such as Times (Roman and *Italic*), **Clarendon** and *Park Avenue*.

Best of all, LePrint is designed specifically for use with **WordStar®**. LePrint can print your existing WordStar documents without modification--including embedded print controls and dot commands. If you use WordStar you already know how to use LePrint.

LePrint is available for the IBM® PC and compatibles. Many popular printers including Epson and Okidata are supported.

Call today for additional information,
or use your credit card to order with our
30-day money-back guarantee.

$250

Call Toll-Free
800-LEBAUGH
(800-532-2844)
In Nebraska 402-733-7600

Dealer and Distributor inquiries invited

LeBaugh™
Software Corporation
2720 Greene Avenue
Omaha, Nebraska 68147

WordStar is a registered trademark of MicroPro International. IBM is a registered trademark of International Business Machines Corporation.

CIRCLE 303 ON READER SERVICE CARD

DUST OFF YOUR PC

It's time for it to earn its keep.

SUMIT
ACCOUNTING

by George Polichar

My twelve year old daughter is the programmer in my family. I just pay the bills.

I spend my time running my business, and I need a computer for my accounting and record keeping. I don't need to spend time writing programs. So I looked for a simple way to develop my company's custom data base. Revelation* allowed me to be productive immediately. Revelation is also a very powerful programming tool, but I couldn't find the time to develop a comprehensive accounting system. Running my business was more important. After all, I pay the bills.

So my PC gathered dust.

Then I tried SUMIT. The first time I tried it, I entered a customer and printed an invoice! No problem! Six weeks later I'm printing checks, aging receivables, and producing a general ledger trial balance. My CPA is ecstatic with the audit trails, and the bank raves about the agings.

The system operates very consistently. After running receivables, learning AP and GL was a snap. And, since all the reports are produced with English statements, I can easily tailor them to my needs. The documentation makes it all easy. Next, I'm doing my income sheet using SUMIT's financial statement report generator.

With all my accounting records on SUMIT, I have instant access to a variety of financial information, in any format I want. Next time an auditor asks for all my taxable sales records, he'll get it in seconds!

I wasn't really taking any chances. SUMIT came with a money back guarantee.

Try it out yourself. Just send $495 (plus tax in California) to Sum Data Systems, 3224 Thatcher Ave., Marina del Rey, Ca. 90292. (213) 306-2808. Test SUMIT out with your Revelation system for 30 days. If it doesn't make your PC earn its keep, send it back for a complete refund.

There's only one rub. With SUMIT doing my bookkeeping, I have so much free time I'm afraid my daughter is going to teach me Fortran.

SUM DATA SYSTEMS

SPECIALIZING IN PICK APPLICATIONS

From micro to mainframe, there's nothing left to buy.

©SUM DATA SYSTEMS 1984

CIRCLE 492 ON READER SERVICE CARD

*Revelation, a product of COSMOS, INC. is also available from Sum Data Systems.
PICK Operating System is a Trade Mark of PICK SYSTEMS.

used this technique from the very beginning. Briefly, the difference between the traditional interpreter approach used by IBM PC BASIC and the semi-compile approach of PBASIC is that overall the semi-compile version is quicker to use.

With an interpreter, each time an instruction assumes control in the program, it is individually converted into executable code and then executed. If you have a loop in which a line of code assumes control 500 times, the instruction is converted and executed 500 times.

With a semi-compiler, the program is first converted into an intermediate form, which Morgan calls pseudocode. The pseudocode is not directly executable by the computer. It is a partially converted code that will be completely converted by a run-time routine, which is part of the PBASIC language. There are several advantages to this approach. The program executes faster; the semi-compiler checks and flags all logic errors; and there is no performance penalty for the definition of often-used variables late in the program execution.

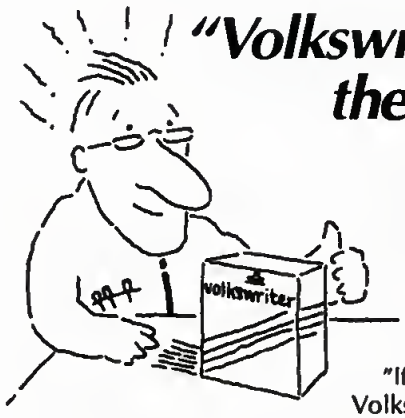
This approach's disadvantage is that the semi-compile process itself, not the overall run, is time-consuming. In PBASIC when you enter RUN, the program pauses before beginning. The pause is unnoticeable for small programs, but can be distracting for ones that are 150 lines or more.

Other environment features and some restrictions are:

- Integer variable can be plus or minus 2 billion;
- The DIM statement supports upper and lower bounds. For example, the statement DIM YR.TOT(1983 to 2000) is allowed. A subscript value of 1983 would reference the first field in the table;
- The SAVE command saves programs in the ASCII format only. A compressed format is not supported;
- When PBASIC stores numbers in a random file it uses the IEEE standard format instead of the nonstandard one used by the IBM BASIC. Random files are therefore not compatible between the two products.

Syntax Review

The environment feature called "Dynamic Syntax Checking", deserves particular attention. PBASIC checks each character you enter when in the command



"Volkswriter® Deluxe..." the critics' choice!

"Thirty word processing programs were reviewed ... no other program received a higher overall evaluation than Volkswriter Deluxe."
Software Digest Ratings Newsletter, January 1984

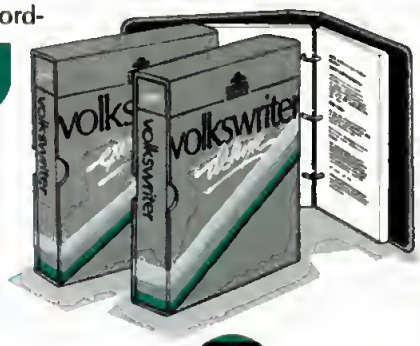
"If WordStar™ set a standard ... Volkswriter Deluxe sets a new standard for transparency, simplicity, and speed. You can learn Volkswriter in under an hour ... because it does so many things exactly the way you think they should be done."

"VOLKSWRITER DELUXE is the best buy in the IBM-PC™ writing tool arena."
Charles Spezzano, Whole Earth Software Review, January 15, 1984

"Volkswriter Deluxe ... a simple way to word processing power ... for writers who like to think."
Washington DC Capital PC User's Group Vol. 3, #4

"Lifetree ... provides exceptionally helpful and competent assistance to registered owners, and the company's update policies are excellent."

"In sum, this is a unique word-processing program."
John Lombardi, Reviewer, InfoWorld, April 16, 1984



We couldn't have said it better ourselves!

Suggested Retail Price: Volkswriter Deluxe $295 for the IBM-PC, PC compatibles, TI Professional™ and TRS-80 Model 2000™

"simply, amazing"

LIFETREE SOFTWARE INC™

411 Pacific Street
Monterey, California 93940
(408) 373-4718 / TWX 176786

IBM PC is a trademark of International Business Machines. TI Professional Computer is a trademark of Texas Instruments. TRS-80 Model 2000 is a trademark of Tandy Corp. WordStar is a trademark of MicroPro.

© 1984 Lifetree Software, Inc

CIRCLE 385 ON READER SERVICE CARD

mode and ignores any key press that would cause a syntax error. If you enter three invalid characters in a row, PBASIC will beep for the first two and display a "try line" on detecting the third. The try line shows all characters valid at that point in the syntax of the statement you are entering.

With this system, it is impossible to enter a code line with a syntax error while in the command mode. If you change the source file on the disk using any editor capable of handling standard ASCII files and then read the program into PBASIC, the product will check syntax and flag errors it finds as part of the read process.

Commanding Levels

PBASIC uses several new and unusual commands at the command level. One useful feature of PBASIC is the FIND LABEL command. This function will list every line in the program that refers to "label." In this case, *label* refers to both procedure and variable names. Another version of the command is FIND LABEL =. Coded this way, the command will list only those lines in which the value of the variable is changed. A companion operation is the SEARCH STRING command. It will list every line that contains the specified string.

PBASIC uses several new and unusual commands at the command level.

The language allows the setting of break points at a given line number or procedure name. When the line or procedure name gets control during program execution, the program stops. This is the equivalent of coding a STOP verb to force the program to quit at a strategic moment. The NOBREAK function will remove some or all break points with one command, and,

CIRCLE 118 ON READER SERVICE CARD

CertiFLEX™

Working harder to solve a world of accounting problems

CertiFLEX accounting software was specifically designed by Certified Public Accountants to address a wide range of accounting needs. We offer a full product line, including **network support** and Lotus 1-2-3 interface. These reliable, field-proven packages are available on popular computers such as the IBM PC/XT, and include a full two-year warranty.

Our standard packages are competitively priced at $549 retail. They include Accounts Receivable, General Ledger, Accounts Payable, Inventory, Payroll, Fixed Assets and Order Entry. Most important for first-time computer users, CertiFLEX offers ease of operation and unsurpassed support.

Ease of operation.
CertiFLEX packages are easy to learn, easy to install and easy to use. Each comes with comprehensive documentation, and CertiFLEX is **functionally integrated** to save time and reduce errors in day-to-day use.

SEE US AT NCC '84
BOOTH #D-417

CertiFLEX

CertiFLEX is a trademark of CertiFLEX Systems
2526 Manana Drive
Dallas, Texas

Unsurpassed user support.
Only CertiFLEX offers **free 30-day** user phone support. Our professional staff is ready to answer all your questions during the initial start-up period. We also offer extended phone support and programming for custom forms.

Unsurpassed dealer support.
Only CertiFLEX provides free in-store training to our dealers. This allows our dealers to better serve customer needs. We also provide a convenient toll-free order number, and all orders are sent prepaid second-day air.

See for yourself why no one works harder to solve your world of accounting problems. For more information, please call CertiFLEX Systems at (800) 237-8435; in Texas (214) 350-6641.

CIRCLE 238 ON READER SERVICE CARD

in any case, the break points are never saved with the program. The BREAK command is the first of many tools integrated into PBASIC to simplify learning and debugging of the BASIC code.

Another notable feature is the FINETRACE facility. With FINETRACE turned on, PBASIC will show each intermediate value as a program computes a mathematical operation. For example, if you coded WORK.YR + YR.MO/12 + WORK.DA/365.25, PBASIC would display the next intermediate result each time you pressed the spacebar. It would continue until the final answer is calculated. The FINETRACE mode is invoked automatically during the program execution of certain run-time errors. Division by zero is an example.

Unfortunately, some valuable features of IBM PC BASIC have not been incorporated in PBASIC. One is the built-in full-screen editor. While this has some drawbacks, it clearly is superior to the old line editors that came before. Unfortunately, PBASIC has only a line editor. Although it is a good one, it does not support full-screen editing. This appears to be one of the casualties of implementing the dynamic syntax checking subsystem.

Some valuable features of IBM PC BASIC were not incorporated in PBASIC.

No Keyboard Macros

Another feature missing is keyboard macros. With IBM PC BASIC, you can hold down the ALT key and press the P for PRINT. Many of these macros made entering code faster and less error prone. With PBASIC, the coding errors are not a problem, but each verb must be keyed in as there are no shortcuts. However, this is not so with the variable and procedure names. If you enter enough of the labels to make it unique and the "at" sign (@), PBASIC will complete the entry for you.

Visual Modes

The heart of PBASIC is its program debugging and display windows. There are more than 17 of them, and they allow a level of control and ease of understanding that has been unavailable until now.

When you test your program, or you wish to see your program execute for any purpose, use the SRUN command. This will run the semi-compile function and set you up at the first window. This window is called the List Trace. The first window line is called the status line. Frequently updated, it contains a variety of information including:

- The line number of the next instruction to be executed;
- The number of instructions executed so far;
- The speedometer (the number of instructions executing per second);
- Status of the Ctrl, Alt, Shift, CapsLock, and NumLock keys;
- Windows currently active;
- Number of active FOR/NEXT and GOSUBs;
- The cursor's current location on the user screen (row and column).

The currently executing instruction is highlighted on the screen by a green bar, which moves when each instruction is carried out. From a training and learning perspective, this new visual format has enormous consequences. Now a loop becomes a visible pattern on the screen—not an abstract concept. The operation of a GOSUB is easy to track and understand. Other verbs, that were once complicated to explain and difficult to grasp, now become clear.

When you first enter the List Trace window, program execution is suspended. Each press of the spacebar progresses the instruction. If a branch takes place off the screen, the display is instantly updated and the new code revealed. By holding down

CertiFLEX

Working harder to solve your accounting problems

CertiFLEX has been solving a world of accounting problems since 1979. We have successfully installed our software packages in a wide variety of businesses across the country. Now we'd like to help you.

If you've thought about computerizing your accounting operation, but thought you'd have a hard time making it work, let CertiFLEX make it easy. For more information, please call your local computer dealer or CertiFLEX at (800) 237-8435. In Texas, (214) 350-6641. We'll show you how the CertiFLEX difference can make a difference for you.

CertiFLEX

All you'll ever need in Accounting Software.

"Thoughtware, How Can I Become A More Effective Leader?"

Thoughtware is new, easy-to-use software that will help you see and understand how to become a better manager. It's a unique series of personal, computer-based management diagnostic and training programs.

® Thoughtware is a registered trademark of the Institute for Management Improvement.

How can you become a more effective leader? Thoughtware Program 2.1, "Leading Effectively," will tell you. This four part program has been designed to help managers improve their effectiveness as leaders. It gives you an opportunity to assess your own management style and to compare your results to the self-assessments of other managers.

Unit 1 defines leadership and discusses its three key elements—style, situation and strategy. It stresses the importance of matching the leadership style to the situation and of getting and giving feedback.

Unit 2 is designed to improve your leadership style and increase your ability to perform more effectively. You will see the difference between the kinds of power you exert and the importance of using your influence to affect the behavior of others. You'll also learn about three factors affecting your leadership style: the assumptions you make about people, the degree to which you are task- or people-oriented, and the attitudes you have about the competence of those you supervise.

Unit 3 asks you to analyze a leadership situation you currently face in order to determine what style of leadership is appropriate for your particular situation.

Unit 4 offers guidance on how to use eight effective leadership conditions.

To take advantage of the incredible new technology that is Thoughtware, see the adjacent column.

Thoughtware Programs run on the following:
IBM® PC and compatibles with color graphics card.
Apple® II Plus and IIe.

Thoughtware®

Expanding The Universe Of Learning.

CIRCLE 424 ON READER SERVICE CARD

Thoughtware Is The Future.

It's a new way to learn, a logical and innovative approach to management training. It will revolutionize management training now, and in the future. Thoughtware utilizes the latest research in management development from leaders in the field, and has been tested nationally.

For individuals and their organizations, the educational, economic and operational benefits of Thoughtware's computer-based learning programs are enormous. But Thoughtware isn't just the future.

Thoughtware Is The Present.

Some of the corporations and organizations who have purchased Thoughtware's Assessing Personal Management Skills Program include:

American Express	Ingersoll-Rand
American Mgt. Assoc.	IRS
Apple Computer	Johns Hopkins Univ.
AT&T	Levi Strauss
Avon	Marriott
Bankers Life	Marsh & McLennan
Blue Cross & Blue Shield	Mass. Mutual
Bank of Boston	McGraw-Hill
Bureau of the Census	MCI
Chevron USA	U.S. Navy
Ciba-Geigy	NCR
Citibank	NYU
City of Dallas	Owens-Illinois
Crown Zellerbach	Owens-Corning Fiberglas
Dow Jones	Royal Cup Coffee
Dun & Bradstreet	Sentry Insurance
Du Pont	Singapore Embassy
Ernst & Whinney	Stone & Webster
Exxon	St. Regis Paper
Federal Reserve Bank	Tampax
Fireman's Fund	The Nestle Co.
General Electric	The Rouse Co.
General Foods	3M Corporation
Georgia-Pacific	TRW
Gov't of Canada	Univ. of Illinois
Gulf Oil Corporation	United Parcel Service
Hewlett Packard	United Way
Horn & Hardart	Univ. of Mass.
Hughes Aircraft Co.	Westmoreland Coal
Husky Oil	Westinghouse Corp.
IBM	Xerox

And hundreds more. What they've learned, you can now discover.

You can reap the benefits of Thoughtware by visiting your local IBM Product Center, computer dealer, or call toll-free 1-800-THT-WARE for the dealer nearest you. Or write:

Thoughtware Inc.
Suite B, 2699 So. Bayshore Dr.
Coconut Grove, Florida 33133.

Thoughtware Programs include:
1.1 Assessing Personal Management Skills ($350)
2.3 Defining Goals And Objectives ($450)
2.6 Managing Time Effectively ($450)


```
190          20  000          X      ]v step f 0 g 1  1  1 V 0
 10 'SIMPLE EXAMPLE PROGRAM WRITTEN \
 20 'AUTHOR ==) DP GEORGE                  bill.da!          15
 30 'DATE   ==) 04/30/84
 40 GOSUB INITIALIZE.PCM.RTM               bill.mo!          7
 50 GOSUB CALC.DATE.FACTOR
 60 GOSUB DISPLAY.RESULT                   90 bill.yr!       84
 70 GOTO 70
 80 INITIALIZE.PCM.RTM;'                   150 conv.bill.date! 84.6244
 90 BILL.YR = 84
    BILL.MO = 07                           160 conv.curr.date! 80.08607
    BILL.DA = 15
100 CURR.YR = VAL(RIGHT$(DATE$,2))         120 curr.da!      1
110 CURR.MO = VAL(LEFT$(DATE$,2))
120 CURR.DA = VAL(MID$(DATE$,4,2))         110 curr.mo!      1
130 RETURN
140 CALC.DATE.FACTOR;'                     100 curr.yr!      80
150 CONV.BILL.DATE = BILL.YR + BILL.\
160 CONV.CURR.DATE = CURR.YR + CURR.\      170 date.factor!  4.53833
170 DATE.FACTOR = CONV.BILL.DATE - C\
180 RETURN                                       9 / 9
190 DISPLAY.RESULT;'
200 CLS
210 PRINT DATE.FACTOR
220 RETURN
```

Figure 1: *Split screen, List Trace, plus Variables window. The current instruction is highlighted.*

```
190          20  000          X      ]t step f 0 g 1  1  1 V 0
 10 'SIMPLE EXAMPLE PROGRAM WRITTEN \       6    90 BILL.YR = 84
 20 'AUTHOR ==) DP GEORGE                          bill.yr! 84
 30 'DATE   ==) 04/30/84                    7      BILL.MO = 07
 40 GOSUB INITIALIZE.PCM.RTM                       bill.mo! 7
 50 GOSUB CALC.DATE.FACTOR                  8      BILL.DA = 15
 60 GOSUB DISPLAY.RESULT                           bill.da! 15
 70 GOTO 70                                 9   100 CURR.YR = VAL(RIGHT$\
 80 INITIALIZE.PCM.RTM;'                           curr.yr! 80
 90 BILL.YR = 84                           10   110 CURR.MO = VAL(LEFT$(\
    BILL.MO = 07                                   curr.mo! 1
    BILL.DA = 15                           11   120 CURR.DA = VAL(MID$(D\
100 CURR.YR = VAL(RIGHT$(DATE$,2))                 curr.da! 1
110 CURR.MO = VAL(LEFT$(DATE$,2))          12   130 RETURN
120 CURR.DA = VAL(MID$(DATE$,4,2))         13    50 GOSUB CALC.DATE.FACT\
130 RETURN                                 14   140 CALC.DATE.FACTOR;'
140 CALC.DATE.FACTOR;'                     15   150 CONV.BILL.DATE = BIL\
150 CONV.BILL.DATE = BILL.YR + BILL.\              conv.bi\ 84.6244
160 CONV.CURR.DATE = CURR.YR + CURR.\      16   160 CONV.CURR.DATE = CUR\
170 DATE.FACTOR = CONV.BILL.DATE - C\              conv.cu\ 80.08607
180 RETURN                                 17   170 DATE.FACTOR = CONV.B\
190 DISPLAY.RESULT;'                               date.fa\ 4.53833
200 CLS                                    18   180 RETURN
210 PRINT DATE.FACTOR                      19    60 GOSUB DISPLAY.RESULT
220 RETURN                                 20   190 DISPLAY.RESULT;'
```

Figure 2: *Split screen, List Trace, plus Chronological Trace.*

the spacebar, execution continues slowly. If the Enter key is pressed, program execution begins at full speed and the highlight bar blurs across the screen attempting to keep up. Another press of the spacebar freezes the action, and the program stops again.

Using these simple tools, you have complete control over the program's execution. With break points, which can be inserted in this mode by pressing a single-key combination, the program can be executed at full speed until a point of interest is found. Then you can do single-step tracing to follow the program's exact logic path. These are only a few of the many features.

One option of the List Trace window

that will flag each unexecuted line. Another option of this window displays the number of times each verb assumes control; yet another option dynamically creates an in-line histogram, a horizontal bar chart, next to each line. This shows graphically how long each instruction has taken to execute as a percentage of total run time. To invoke these other options you need only press a single key.

Windows on BASIC

By pressing the V key, you change the display instantly to the variable window. This screen shows alphabetically every nonarray variable in the program along with the variable type code and actual value. The usual scrolling keys (PgUp, PgDn, and the arrow keys) can be used to move through the display. While this is interesting and helpful, it is more useful to look at both windows simultaneously and PBASIC provides this capability. The screen is divided in half vertically and each window gets half the display, as Figure 1 shows. Whenever an entire line cannot be displayed because of a small window, a backslash (\) symbol appears to mark the break.

To invoke the split-screen mode from the List Trace window, you simply press S (for split). The default second window is the Variables window, but any one of several windows can be selected. Even their position (left side of screen or right side of screen) can be changed instantly by pressing the E key (for exchange).

When I say *instantly*, I mean it. I made a few short benchmark runs testing screen display speed. The results showed PBASIC is almost five times faster than IBM PC BASIC at displaying information on the screen, and four times faster than compiled BASIC. Although the tests were simple and incomplete, the results illustrate the product's screen-handling efficiency.

In spite of all this activity on the display, normal screen output produced by my program is still simple to achieve. By pressing P (for print screen), you are immediately shown the screen display produced by your program. Whenever your program issues an INPUT verb or INKEY$ verb, this action happens automatically. In this mode, all of the keys have their usual meaning, that is, S is the letter S, not the split-screen command. To get out of this mode, you use the Alt-letter

A NEW KIND OF COMPUTER STORE

★ WE DISCOUNT EVERYTHING ★

Hayes
300 BAUD 219.95
1200 BAUD 479.95
★ 1200 B INTERNAL 399.95
★ INCL. FREE SOURCE SUBSCRIPTION/ SMART COM II ★

MicroPro
WORDSTAR 269.95
WORDSTAR PROFESSIONAL 359.95

AMDEK 310A 159.95
TAXAN 420 RGB W/CABLE...CALL

SIDEWAYS 45.95

MICROSOFT
MULTIPLAN 129.95
WORD WITH MOUSE 299.95

COPY II PC 29.95

KOALA PAD 99.95
PFS: FILE, WRITE, REPORT, GRAPH ..... EA. 89.95

dBASE II 349.95

Lotus 1-2-3 ...299.95

OKIDATA ★ INCL. FREE PLUG & PLAY W/IBM CABLE PURCHASE ....29.95 ★
★ OKI 92P 439.95
★ 93P 659.95

MICROCOM Era 2 ..... 339.95
INCL FREE SOURCE TIME & TERMINAL SOFTWARE

AST RESEARCH INC.
AST 6 PAK + 64K 269.95
AST MEGA + II 64K 269.95

MANAGING YOUR $ 129.95
KNOWLEDGEMAN 349.95
DOLLARS & SENSE 99.95
EPSON FX 80 F/T 449.95
EPSON FX 100 F/T 659.95

NEC ★ 2050 ..... 799.95
★ 3550 ..... 1595.95
★ INCL. RIBBON & THIMBLE ★

Verbatim.
SSDD 23.95
DSDD 34.95

★ ★ CALL FOR OTHER PRICES ★ ★
BECAUSE HARDWARE AND SOFTWARE PRICES ARE CHANGING SO RAPIDLY, WE URGE YOU TO CALL US FOR OUR VERY LOWEST CURRENT PRICES!
WE APPRECIATE YOUR BUSINESS and will do everything we can to make you happy
TERMS: F.O.B. Westminster CA We accept VISA, MasterCard Cash Checks Certified Checks are better Money Orders and Purchase Orders: 2% 10-Net 15! Add 2% for bank cards & P.O.'s. Ask about our return policy Prices are subject to change and hopefully will go down! Subject to stock on hand 7/84

GARDEN OF EDEN COMPUTERS
ORDERS ONLY
800-762-3227
OUTSIDE CALIFORNIA ONLY
714-841-4994
INSIDE CALIFORNIA
16485 Magnolia, Westminster, CA 92683
½ blk. N. of the 405 Frwy
Mon-Fri. 10-6:30 Sat 10-5
CLOSED SUNDAYS & TUESDAYS

CIRCLE 252 ON READER SERVICE CARD

combinations. For example, Alt-v will take you to the Variables window and Alt-l to the List Trace window.

Other Specialized Windows

PBASIC has many more useful windows to work with, including one that handles the display of array variables only. This screen is formatted like the Variables window but has additional scrolling keys to handle large tables. With this window you can scroll 100, 1000, even 10,000 lines at once by pressing a single key. Windows are provided to track GOSUBs and FOR/NEXT loops. For each FOR/NEXT pair active, this PBASIC window displays the beginning index value, ending index value, increment value, and current value of the index.

One of the most important windows is what Morgan calls the "Chronological Trace Window." Figure 2 shows an example of this window split with the List Trace window, which is the way you would most often use it. The Chronological Trace displays each instruction as it executes, along with a unique "serial number." This turns out to be the associated instruction count. If the instruction modifies any variables, the trace also displays the new value of the modified ones. With the List Trace, the displayed code remains static, and the highlight bar dances around. The Chronological Trace works differently; the instructions scroll from the bottom screen to the top. Each time a new instruction is executed, the oldest instruction at the top scrolls off.

Chronological Listing

However, Chronological Trace's importance is not the way it scrolls, but the options it offers. What this trace allows you to do is run the program backwards. More accurately, PBASIC saves previous program lines and enables you to review these lines simply by pressing the appropriate scrolling keys. In operation, it appears that you can run the program forward, then back up several hundred lines at will and review the results. The combi-

By Niklaus Wirth's standards, SBB Pascal is the best Pascal compiler for the IBM* Personal Computer.*

In benchmarks using a suite of nine test programs written by Niklaus Wirth to objectively assess the capabilities of Pascal compilers, SBB Pascal outperformed its competitors in both speed and compactness of coda.

The results of the Eratosthenes' sieve benchmark giva just a hint of SBB Pascal's efficiency:

	SBB Pascal	MS-Pascal™	Pascal/MT+86™
Execution time (in seconds)	**11.10**	11.70	14.70
Code size (in bytes)	**203**	229	294
.EXE file size (in bytes)	**4608**	27136	10752

Overall, our competitors' execution times averaged 1.58 times SBBs', their code sizes averaged 1.21 times SBBs', and their .EXE file sizes averaged 3.31 times SBBs'. Call for free brochure with full benchmarks

Personal Use Compiler Package $95.00

Development Package $350.00

Software Building Blocks™

* Also runs on the PCjr. !

607/272-2807

Software Building Blocks, Inc.
Post Office Box 119
Ithoco, New York 14851-0119

SBB Pascal is a trademark of Software Building Blocks Inc IBM is a registered trademark of International Business Machines Corp MS-Pascal is a trademark of Microsoft Corporation Pascal/MT+86 is a trademark of Digital Research Inc

CIRCLE 473 ON READER SERVICE CARD

BASIC Discovers Shorthand.

Programming in BASIC just got smarter, easier, faster . . . and five great reviews. Before you write another program in BASIC, you might be wise to start with a little reading.

Five major computer publications have something good to tell you. About the BASIC Development System (BDS). And about making your programming in BASIC more efficient than you ever dreamed.

BDS is a powerful, integrated set of software tools that quickly gets you beyond the BASIC basics. It gives you everything from Cross-Referencing to Scrolling Keys that let you scroll by page or line. It gives you Compress and Uncompress commands, Variable Dump, Single Step Trace and more.

BDS also gives you something else. A 30-day money back guarantee.

Finally, BDS gives you great references. From reviewers who've lived with it and loved it. For example: *"I wonder how I ever got along without it." John M. Woram, PC Magazine, September 1983.*

We'll send you the reviews just for writing us. Or, for only $79, we'll send you BDS itself. And a 30-day money back guarantee.

BETATOOL SYSTEMS
BTS
8972 E Hampden Ave • Suite 179
Denver, Colorado 80231 • (303) 793-0145

BDS is available for IBM PC and COMPAQ computers
VISA/MC accepted Please add $3 for shipping

CIRCLE 111 ON READER SERVICE CARD

nation of these functions, with the spatial relationships made clear by the List Trace window, allows observation and rapid understanding of the executing code—something absent from any other language.

PBASIC also provides windows that show memory dumps, windows which show the actual pseudocode being executed, and those that demonstrate all Data items in the program while highlighting each item as read. Still others provide a view of input and output file buffers.

A Clicker Too

There are other unusual features, such as a built-in clicker, which may be turned on or off. As you execute each instruction, you'll hear a click. In this mode, you can hear the program execute and, by sound, determine execution speed.

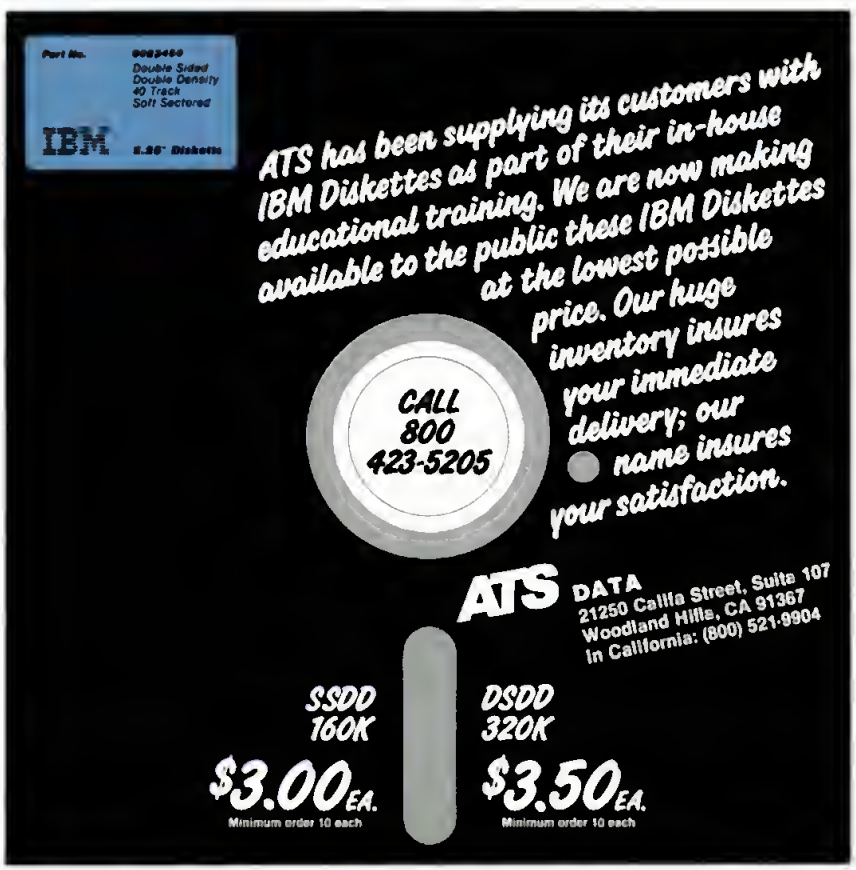
Good as it is, PBASIC has design limitations and drawbacks and is demanding of its systems requirements. Besides the 8087 chip required for the products first release, PBASIC needs also a minimum of 256K and at least one disk drive. The system supports only a monochrome screen or a non-IBM color/graphics adapter. It also requires DOS 2.0 or 2.1.

In spite of the outstanding range of debugging screens and facilities, the product only implements the BASIC language as contained in IBM PC BASIC. Therefore, several flaws common in the IBM PC BASIC are in PBASIC. My main objection is the lack of facilities such as local variables and flexible subroutine calls. After all, a Professional BASIC should allow professionals to write professionally. To Morgan's credit, the company is planning improvements in this area including a 128K mini version of the product and a true native code compiler.

For the first time in the history of both mainframe and microcomputer languages, here is a product that supports powerful and useful visual tools. In doing so it changes the very nature of the program-debugging process. From another perspective, these same facilities are unique in that they provide an environment for learning about the programming process and how programs operate.

If you are programming in BASIC or are learning to program for the first time, you will be hard pressed to find anything better than PBASIC. At the very least, PBASIC is a product to watch. It could well be a harbinger of things to come. ■

Don George is a training manager for a large insurance company in Los Angeles. He is currently authoring two books on BASIC and COBOL.



CIRCLE 107 ON READER SERVICE CARD

PUBLIC DOMAIN SOFTWARE

Find out about the wealth of public domain and user-supported software written for the IBM PC.

Word Processing, modem communications, data base, BASIC utilities, games using color graphics Pascal and assembly language programs, FORTH language, Turtle graphics, spreadsheet templates, RAM disks, spoolers and more...110 page directory.

Directory $4.95 + $1 postage

Set of 10 most popular disks $59

Includes file system, modem communications, spooler, RAM disk, BASIC and DOS utilities, FORTH language, games.

Set of 135 disks $814

DOS 1 1/2 0 compatible format
(CA residents add 6.5% sales tax)

PC Software Interest Group
1556 Halford Ave.
Suite #130G
Santa Clara, CA 95051
(408) 730-9291

CIRCLE 352 ON READER SERVICE CARD

Hard Hats and Bows

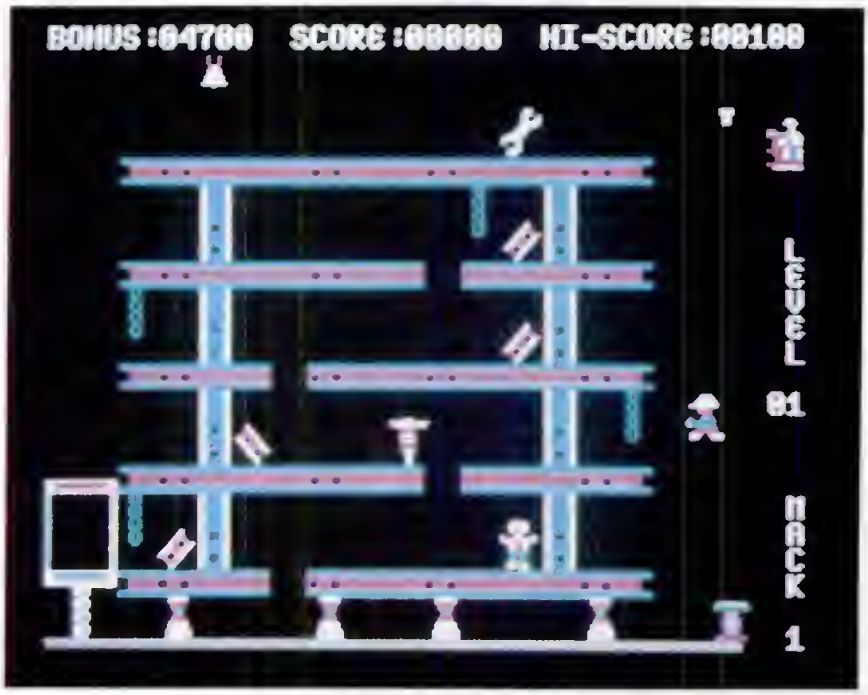
Hard Hat Mack from Electronic Arts is trying to pass itself off as art but ends up as image and hype, while Atari's Ms. Pac-Man turns out to be a woman of substance.

Hooray for Hollywood! The land of make believe, where image is everything. After all, who needs steak when you can simulate a nice juicy sizzle?

And *Hard Hat Mack* has plenty of sizzle. It's Electronic Arts' first arcade game entrant to the IBM PC market, and this company has declared its intent to "fulfill the potential of personal computing" and elevate the computer programmer into the realm of the artist. It has some of the most truly pretentious advertisements ever seen in computer magazines—including soft-focus superstar portraits of their principal programmers (among them pinball wizard Bill Budge). And the packaging for their products is a direct lift from the glitzy world of the record industry: shrink-wrapped double albums complete with color cover photo. Inside you'll find a set of portraits and cutesy biographies of the "artists"—software designers Michael Abbot and Matthew Alexander.

Hard Hat Mack
Electronic Arts
2755 Campus Dr.
San Mateo, CA 94403
(415) 571-7171
List Price: $35
Requires: 64K RAM, color/graphics monitor, joystick and game adapter optional.

CIRCLE 742 ON READER SERVICE CARD



An early screen from *Hard Hat Mack*, showing the building in progress.

The game itself is a variant on the *Donkey Kong* chutes and ladders motif, with a couple of clever twists. You are cast as Mack, "a bona fide Working Class Hero." The game's description says he "reads Eric Hoffer," and is "fueled by cupcakes and an unshakable belief in the work ethic."

Your goal, as you scurry around an attractively drawn construction site, is to finish the building Mack is working on by installing and then riveting beams, moving blocks of steel, and collecting tools. "Sound easy?" the skimpy instructions ask. "Then you're forgetting about government regulations, the neighborhood punks, and the fact that falling bodies (including your own) accelerate at the rate of 32 feet per second^2."

continued

PC WEEK

THE NEWS WEEKLY FOR IBM SYSTEM MICRO COMPUTERS

The first weekly newspaper designed to give key executives the latest IBM Personal Computer news and analyses—*as soon as it happens!*

To keep your company in the forefront of today's rapidly changing IBM Personal Computer technology, you need timely information. Information that's clearly written, bringing you the news the way you need it, when you need it. You need PC WEEK.

PC WEEK is the first and only weekly newspaper devoted to IBM Personal Computer news—with the latest breaking stories as they develop.

PC WEEK follows and reports the news—up to 48 hours before publication—so you learn what's new *when* it's new! You'll find research updates, strategic analysis, new hardware and software reviews, insights on future industry concerns and controversies, and the timely information you need to help make you more productive and efficient.

Every week you'll find outstanding features and departments covering...

- **NEWS: PC WEEK brings you analytical reports on the major topics of the day. Product announcements and company changes are analyzed and put into perspective, helping you plan for future investments and developments.**
- **STRATEGIES: Every week you get an in-depth profile of a leading user company and how they use their IBM and compatible personal computers. Case studies help you evaluate the success and failure of new applications—some you even may have been considering.**
- **INDUSTRY TRENDS: Discover what's happening behind the scenes in new product development from both hardware and software manufacturers and what this could mean to the future of your company.**
- **PRODUCT REVIEWS: In-depth reviews of important new hardware and software releases tell you what product is right for your operation, *and* the technical and financial considerations involved.**
- **FOCUS ON: The latest news and events in specific product areas are detailed every week. We cover file systems, 3270 products, graphics software, input hardware, database managers, program generators, multifunctional applications—the information you need for your IBM installation.**
- **BUYERS GUIDES: Special sections with careful evaluations and comparative charts to help you select the proper peripherals and software packages for your operation. From word processing to local area networks or compatibles, you'll find complete and unbiased reviews and listings.**

Your subscription to PC WEEK is complimentary if you qualify. Take a moment, fill out the Qualification Form at right and return it to PC WEEK today.

PC WEEK, your vehicle to stay in the forefront of tomorrow's IBM Personal Computer technology.

PC WEEK

Get the news you need every week, *first hand*, with PC WEEK.

PC WEEK THE NEWS WEEKLY FOR IBM SYSTEM MICRO COMPUTERS

Complimentary Subscription Application

YOU MUST ANSWER ALL QUESTIONS TO QUALIFY.

1. ☐ Please accept my request for a complimentary subscription to PC WEEK.

2. ☐ No, I do not want to receive PC WEEK.

3. Primary business activity of your firm at this location (check one only).

- ☐ 1 Manufacturing of computer equipment, computers, DP hardware, peripherals
- ☐ 2 Manufacturing other
- ☐ 3. Agriculture, mining, construction
- ☐ 4 Transportation
- ☐ 5. Communications
- ☐ 6 Utilities
- ☐ 7 Computer related retailer
- ☐ 8. Non-computer related retailer or wholesaler
- ☐ 9. Finance, banking, insurance, real estate
- ☐ 10 Health, medical service
- ☐ 11 Legal
- ☐ 12 Education
- ☐ 13. Data processing, computer service
- ☐ 14 Other business services
- ☐ 15. Government
- ☐ 18. Consultant
- ☐ 17. Other (please specify)

4. Your title: (Check one appropriate box)

- ☐ 1 Pres / Owner / Dir / Chmn / Partner
- ☐ 2 Vice-Pres / Gen Mgr
- ☐ 3 Comptroller / Treasurer
- ☐ 4. Vice-Pres Finance
- ☐ 5 Chief Accountant
- ☐ 6 Vice-Pres Operations
- ☐ 7 Dir / Mgr Purchasing
- ☐ 8 Dir / Mgr Office Systems
- ☐ 9 Vice-Pres Sales / Sales Mgr
- ☐ 10 Dir / Mgr Marketing
- ☐ 11 Dir / Mgr / Chief of EDP / MIS
- ☐ 12 Dir / Mgr Programming
- ☐ 13. Dir / Mgr Systems & Procedures
- ☐ 14 Dir / Mgr Communications
- ☐ 15 Dir / Mgr EDP / MIS Operations
- ☐ 18 Dir / Mgr Information Ctr
- ☐ 17. Business Microcomputer Specialist
- ☐ 18 Systems Analyst
- ☐ 19 Data Base Administrator
- ☐ 20 Vice-Pres / Dir R&D
- ☐ 21 Vice-Pres / Dir Engineering
- ☐ 22 Dir / Mgr Plant or Prod
- ☐ 23 Chief Engineer
- ☐ 24 Systems Engineer
- ☐ 25 Design / Production / Research Engineer
- ☐ 26 Consultant
- ☐ 27 Educator
- ☐ 28 Other (please be specific)

5. Do you have any *MAINFRAME* computers or *MINICOMPUTERS* on site at this location?

☐ Yes (If yes, please report accurately below for the two largest)
☐ No

Manufacturer	Model	Quantity

IBM or Compatible Personal (Micro) Computer Information for this location:

(Please report accurately for each model indicated)

Manufacturer's Name, Model	6. Currently Owned (Quantity)	7. Plan To Purchase Within 0-12 Months (Quantity)	13-24 Months (Quantity)	25-36 Months (Quantity)
IBM PC				
IBM PC XT				
IBM XT/370				
IBM PC/3270				
IBM PCjr				
IBM Compatibles (Compaq, Eagle, etc.)				
Other (Not IBM or Compatibles)				

7a. In which of the following ways are you yourself involved with the *Personal (Micro) Computers* at your location?

- ☐ A Use them
- ☐ B Recommend them
- ☐ C Establish specifications
- ☐ D Approve purchase
- ☐ E Acquire them
- ☐ F Other involvement (specify) _____
- ☐ G No involvement

8. The *Personal (Micro) Computers* purchased for this location would be:

- ☐ 1 For internal use
- ☐ 2 For resale
- ☐ 3 Other (please specify) _____

Full company name and company address must appear in spaces below for application to be processed.

OR AFFIX YOUR BUSINESS CARD

PW 1157

Name

Title

Company Name

Division | Telephone Number

Company Street Address

Company City | State | Zip

8a. How are Personal (Micro) Computers normally obtained for this location?

- ☐ A Direct from manufacturer
- ☐ B Manufacturers representative
- ☐ C Distributor
- ☐ D Retail computer store
- ☐ E System house
- ☐ F In-house (company) store
- ☐ Z Other (please specify) _____

9. Please indicate below the communications capability for which these *Personal (Micro) Computers* are used.

- ☐ A Communicate with remote timesharing or database
- ☐ B Communicate with internal mainframe or minicomputer
- ☐ C. Used in local area network
- ☐ D Down load data from mainframe or remote service
- ☐ E None of the above

9a. Please indicate below the applications for which these *Personal (Micro) Computers* are used.

- ☐ 1 Accounting
  - ☐ A Accounts Payable
  - ☐ B Accounts Receivable
  - ☐ C Billing & Collection
  - ☐ D General Ledger
  - ☐ E. Inventory
  - ☐ F. Order Entry & Invoicing
  - ☐ G Time Billing
- ☐ 2. Communications
- ☐ 3 Data Base Management
- ☐ 4 Data Input / Analysis
- ☐ 5 Education
- ☐ 6 Electronic Mail
- ☐ 7 Entertainment (Games)
- ☑ 8 Financial Planning
- ☐ 9 Graphics Design
- ☐ 10 Personal Time Management
- ☐ 11 Portfolio Management
- ☐ 12 Programming
- ☐ 13 Project Management
- ☐ 14 Process Control
- ☐ 15 Scientific or Engineering Applications
- ☐ 16 Statistical Analysis
- ☐ 17 Tax Calculation or Planning
- ☐ 18 Word Processing
- ☐ 19. Other _____

10. Do you help acquire, recommend, specify or approve any of the products or services below?

☐ Yes (If yes, please check all that apply)
☐ No

Computers

- ☐ 1 Mainframe
- ☐ 2. Minicomputer
- ☐ 3. Personal (Micro)

Peripheral Equipment

- ☐ 7 Letter Quality Printer
- ☐ 8 Graphics Printer
- ☐ 9 High Speed Printer
- ☐ 10 Color Monitor
- ☐ 11 Monochrome Displays
- ☐ 12 Modems
- ☐ 13 Hard Disk
- ☐ 14. Tape Backup System
- ☐ 15 CPU Compatibility Card
- ☐ 16 Memory Board
- ☐ 17 Communications Port
- ☐ 18 Plotters / Charting Devices
- ☐ 19 Local Area Networks

Software Packages

- ☐ 21 Communications
- ☐ 22. Accounting
- ☐ 23 Order Entry / Inventory
- ☐ 24 Payroll
- ☐ 25 Time Billing
- ☐ 26 Financial Planners / Spreadsheet
- ☐ 27. Project Managers
- ☐ 28 Word Processors
- ☐ 29 Compilers
- ☐ 30 Database Managers
- ☐ 31 Program Developers / Generator Tools
- ☐ 32 Business Graphics

Outside Services

- ☐ 34 Maintenance
- ☐ 35 Education / Training
- ☐ 36 Software / Systems Design
- ☐ 37 Remote Computing
- ☐ 38 Database Services
- ☐ 39 Other

Expendables

- ☐ 41 Diskettes
- ☐ 42 Stock Paper
- ☐ 43 Forms & Other Consumables

11. Are there any other individuals at this location that would qualify for a complimentary subscription to PC WEEK?

Name _____ Title _____

Name _____ Title _____

Your Signature _____

Your Title _____ **Date** _____

Please be sure to sign your name and list your actual title above
See other side for mailing instructions

SEAL THIS SIDE ONLY—DO NOT USE STAPLES

FOLD HERE

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 3838 NEW YORK, NY

POSTAGE WILL BE PAID BY ADDRESSEE

PCWEEK

P.O. Box 5920
Cherry Hill, NJ 08034

Tormentors

Your tormentors include vandals who "think you're spoiling their neighborhood. They say things about your mother. They have no sense of the value of life, especially yours." Also intent on interfering with the successful completion of your assignment is OSHA. (Get it? Will your 10-year-old kid understand that OSHA stands for Occupational Safety and Health Administration? By the way, has your kid read Eric Hoffer?) OSHA is described as having a "crew-cut, a clipboard, and absolutely no sense of humor—living proof of the banality of evil. The government sends a generous supply of these guys to cite you into oblivion."

Hard Hat Mack has three screens, each busier than the one before, and each requires you to learn one or two basic maneuvers in order to master the round. The authors have done a nice job with some of the little details—the screens are attractive and the play response is good from the keyboard or with the aid of a joystick and game adapter. I like the fact that Mack has to go find the rivet gun and return to the scaffolding to fully install the steel beams. There's a cute sequence involving the construction site elevator, too; to summon it to an upper floor, you have to jump at the right spot and hit the bell with your hard hat. And the third level includes a porta-potty in your path, and a set of live exposed wires at the end of a wrong-way conveyor belt. The game's sound effects are mildly interesting, and they can be shut off if they start to annoy you.

Features

The game includes a joystick calibration subroutine and the ability to redefine keyboard commands for movements up, down, left, and right as well as jumps and drops. You can restart in midplay, and you are allowed to jump from the title screen into any of the three levels, which is a great help when you're practicing. One thing I don't like is that the Ctrl-Alt-Del exit from the game has been disabled; you have to shut off the computer and turn it on again in order to load something else into the machine. High scores are retained in memory but are not recorded on disk, so they are lost after each play session.

Anyway, I may not know much about art, but I know what I like. *Hard Hat Mack* is like computer game pop art—flashy to the eye, but hollow inside. For all of its nice little touches, I quickly became bored. I mastered the first screen pretty easily, stumbled over the more difficult second and third screens, but found that I really didn't feel compelled to learn them. Although obviously well crafted, *Hard Hat Mack* seems to suffer from a lack of precisely what Electronic Arts claims as its forte: the artistic spark that grabs you and makes you want to come back time and time again.

> Your goal is to finish the building Mack is working on by installing and then riveting beams, moving blocks of steel, and collecting tools.

I don't mean to demean Electronic Arts' lofty goals, nor its decision to give credit where credit is due—to the programmers. However, the product should justify the kudos; otherwise we've got nothing but hype, and we deserve more.

I guess what I'm saying is that I did not find *Hard Hat Mack* to be especially riveting. On *PC Magazine*'s rating scale, from a low of 0 to a high of 6, the game would seem to be still under construction:

FUN:	2.5
CHALLENGE:	3.5
COLOR/GRAPHICS:	4.5
TOTAL:	10.5

continued

Introducing Micro-Trivia
An Exciting New Trivia Game!

Micro-Trivia combines the best of the computer and trivia worlds. It's challenging . . it's fun . . and it's a great way to learn little known facts. You can play with up to 4 teams or players at home, at parties or even at the office. All you need is your IBM personal computer or IBM compatible and a quick mind.

Micro-Trivia features:
- 3000 questions in 5 categories
- Degree of difficulty option
- Clock with countdown timer
- Audio and video signals
- Scoreboard with permanent file
- Error-resistant, easy-to-understand rules

And for a limited time only, we're offering a special low introductory price of just $29.95, plus $2.00 for shipping and handling. It costs far less than similar games currently on the market, and we'll ship promptly upon receipt of your order. To order, call toll-free **1-800-356-5310** (in WI call **1-800-362-3565**), or complete the coupon below.

Yes, please send me Micro-Trivia at the special introductory price of $29.95 plus $2.00 for shipping and handling. (Wisconsin residents add 5% sales tax.)
Enclosed is ___ Check ___ Money Order
Charge to: ___ MasterCard ___ VISA
Card No. _____
Expiration Date _____
Signature _____
Print Name _____
Address _____
City _____ State _____ Zip _____

Mail to: **Micro-Trivia, Inc., 306 E. Wilson St., Madison, WI 53703.**

Micro-Trivia
© 1984 Micro-Trivia

CIRCLE 343 ON READER SERVICE CARD

DISCOUNT

BUSINESS & EDUCATIONAL SOFTWARE & HARDWARE

FOR APPLE® & IBM PC®

CATERING TO THE EXPERIENCED COMPUTER USER. Your computer experience means lower prices — you don't pay for support you don't need. PRICES SLASHED!!

APPLE II & IIe PRODUCTS

BUSINESS/FINANCIAL SOFTWARE

	LIST	COST
Ashton Tate dBASE II	$695	$409
Ashton Tate FRIDAY	295	224
Eagle MONEY DECISIONS VOL. 1	199	144
Applied Software VERSAFORM	389	272
LJK Enterprises DATA PERFECT	130	91
RPI Systems GENERAL ACCOUNTING	395	288
Continental CPA GENERAL LEDGER	250	174
Muse SUPER TEXT HOME OFFICE	125	86
Muse SUPER TEXT PROFESSIONAL	175	122
Sensible SENSIBLE SPELLER	125	R7
Sorcim SUPER CALC 2(Z-80)	295	20R
Artsci MAGICALC	150	98
Stoneware DB MASTER V 4	350	254
Dow Jones MARKET ANAYLZER	349	261
Dow Jones MARKET MANAGER	299	224
Dow Jones MARKET MICROSCOPE	699	$24
Continental HOME ACCOUNTANT	75	53
Continental PROPERTY MANAGEMENT	495	349
Aardvark PERSONAL TAX PLANNER	99	72
Oetamosl PROPERTY MANAGER	295	211
Microsoft MULTIPLAN	195	139
Monogram DOLLAR SERSE	100	72
*** SUPER INTRODUCTORY SPECIAL ***		
STC BASIC RECIPES	250	134

WORDPROCESSING SOFTWARE

Soft/Sys EXECUTIVE SECRETARY	250	198
Artsci MAGIC WINDOW II	149	98
Silicon Valley WORD HANDLER	60	44
Broderbund BANK STREET WRITER	70	51
Kensington FORMAT II	150	109
LJK LETTER PERFECT	150	109
Sierra On-line HOMEWORD	70	$1

EDUCATIONAL SOFTWARE

Terrapin TERRAPIN LOGO	99	69
Versa MEEY THE PRESIDENTS	40	29
Xerox STICKY BEAR ABC	40	29
Zeitgeist SPACE MOUSE	50	36
Harcourt Braca COMPUTER SAT	90	64
Milton Bradley PERCENTS	50	35
Scholastic MICROZONE	40	29
Addison Wesley MATH ACTIVITY	75	54
Avant Grade PAL READING MASTER	100	69
Avant Grade PAL READING 1-6 EA	100	69

100's MORE EDUCATIONAL PROGRAMS IR STOCK FOR IBM AND APPLE. CALL FOR PRICIRG.

UTILITIES/ACCESSORIES/HARDWARE

M01 SS/DD DISKETYES (Box 10)	40	1R
USI ASCII EXPRESS PROFESSIONAL	130	97
SOS ROUTINE MACHINE	65	49
Einstein EINSTEIN COMPILER	129	97
Epson EPSON FX-80 PRINTER	695	$29
Distar THINLINE DISK DRIVE	395	189
Koala KOALA PAD	125	89
Coex 16k KAMCARO	99	54
SPECIAL GRAPHICS CARO BETTER THAN GRAPPLER		
Our Own OK JOHNS GRAPHICS RX	149	99

IBM PC PRODUCTS

DATA BASE/FINANCIAL

	LIST	COST
Lotus 1-2-3-	$500	$334
Monogram DOLLARS SENSE	165	$16
Microsoft MULTIPLAN	195	139
Ashton Tate dBASE II	695	409
Delta Tech PROBASE	350	249
Delta Tech PROBASE W/GENERATORS	650	465
Micro-Rim R:BASE SERIES 4000	495	349
Software Publishing PFS:REPORT	140	98
Software Publishing PFS:FILE	125	88
Software Publishing PFS:GRAPH	140	98
Dow Janes MARKET ANALYZER	349	261
Dow Jones MARKET MANAGER	299	224
Dow Jones MANKET MICROSCOPE	699	$24
Dow Jonas INVESIMENT EVALUATON	149	112
Dow Jones SPREADSHEET LINK	249	187
Stoneware DB MASTER	595	419
Continental HOME ACCOUNTANY	150	99
Applied Software VERSAFORM	389	272
Howardsolt TAX PREPAREN '84	250	194
Eagle MONEY DECISIONS	199	142
** SUPEN INTRODUCTORY SPECIAL **		
STC MULTISOLVER	295	1R9

WORDPROCESSING SOFTWARE

Microsoft WORO	375	264
Microsoft WORO W/MOUSE	475	334
Visicorp VISIWORO	375	264
Einstein EINSTEIN WRITER	300	219
Select SELECT WORO PROCESSOR	295	209
Software Publishing PFS: WRITE	140	98
Softword MULTIMATE	495	349
Muse SUPER TEXT PROFESSIONAL	175	129
Micropro WOROSTAR	495	319
Hayden PIE WRITER	199	142
IUS EZ WRITER I	250	1R3
IUS EZ WRITER II	395	295
Perfect Software PERFECT WRITER	349	248

EDUCATIONAL SOFTWARE

Davidson SPEED READ II	70	$1
Spinnaker DELTA DRAWING	49	34
Counterpart EARLEY GAMES MUSIC	30	22
Barrons BARRONS COMPUTER SAT	90	64
Designware MATHMAZE	40	2R
Learning Company MOPTOWN HOTEL	40	28
Scarborough MASTERTYPE	50	36
Microsoft FLIGHT SIMULATOR	50	36

100's MORE EDUCATIONAL PROGRAMS IN STOCK FOR IBM AND APPLE. CALL FOK PRICING.

UTILITIES/ACCESSORIES/HARDWARE

MD2 DS DD DISKETTES (Box 10)	50	21
Fox Geller QUICK CODE (dBASE)	295	209
Microsoft CROSSTALK	195	142
Koala Technologies KOALA PAD	150	112
P Norton PETER NORTON UTILITES	80	58
Quadram QUADLINK FIRMWARE	6R0	489
Hayes Micro SMARTMODEM 1200B	599	449
Rosesoft PROKEY	129	92

IF YOU DON'T SEE IT HERE, CALL.
OVER 2,000 ITEMS IN STOCK AT LOW PRICES FOR IMMEDIATE SHIPMENT.
MOST ORDERS ARE SHIPPED WITHIN 48 HOURS. WE WILL NOT CHARGE YOUR CREDIT CARD UNTIL YOUR ORDER IS READY TO SHIP. YOUR SATISFACTION IS OUR ONLY OBJECTIVE!

800-223-5348

(ORDERS ONLY) MON THRU FRI 10-4 PACIFIC TIME

(WA. residents & Technical Assistance) (206) 481-2600

P.O.'s from Schools & Major Corporations accepted.

TERMS: Mail order only. Minimum order $100.00. All sales final. Prices shown are for prepaid orders and are subject to change without notice. All merchandise is new with manufacturer's warranty. We cannot guarantee product compatibilities.

PAYMENT: Mastercard & Visa: No extra charge. American Express: Add 3% of total order. Cashiers Ck./MO-bank transfers. WA residents add 7.8%.

SHIPPING/HANDLING: Add 2% UPS-surface (min. $5). Add 4% UPS-air (min. $10). Postal Foreign, Special handling add $10 plus postage and shipping. Hardware extra — call for shipping costs.

13452 NE 175th, P.O. Box 1028, Woodinville, WA 98072

NOW IN OUR 4TH YEAR

CIRCLE 522 ON READER SERVICE CARD

PC ARCADE

Ms. Pac-Man
Atarisoft
P.O. Box 61657
Sunnyvale, CA 94086
(408) 745-2000
List Price: $34.95
Requires: 128K RAM, color/graphics board, joystick and game adapter optional.

CIRCLE 741 ON READER SERVICE CARD

Feminists take note: *Ms. Pac-Man* is, as the advertisements claim, "More than *Pac-Man* with a bow." I found this game to be more lively, more playable, and ultimately more enjoyable than the original, and Atari has done an admirable job in transferring this coin arcade favorite to the small computer screen.

If there is anyone alive who doesn't know the basic premise of *Pac-Man*-type games, it goes like this: You are a cute little round character with a huge appetite for little dots that litter the alleyways of a maze. You must scurry through the maze, eating up as many of the dots as possible, all the time avoiding the pursuing "goblins" who mean to eat you! In the corners of the maze are enticing "power pills" that, once eaten, turn the tables for a few precious seconds. At that point, *Ms. Pac-Man* can chase after and eat the ghosts for extra points. When the magic moment is over, it's back to hot pursuit.

Now, thus far this description could apply to both *Pac-Man* and *Ms. Pac-Man*, both of which are available for the IBM PC in official versions from Atari. But in this new, distaff version, the heroine (adorned with a little bow) is much more wily. She moves more easily than her male friend, she lives in a more refined maze with extra escape tunnels, and she seems to be able to beguile her ghostly pursuers into mistakes of strategy. I imagine she's a real Pac-Mankiller.

There are four different mazes in the computer game version, with a little animated scene dramatizing the meeting, courtship, and enrapturing of Mr. and Ms.

SAVE HUNDREDS OF $$$ BY UPGRADING MEMORY BOARDS YOURSELF!

INTRODUCING...

IBM MEMORY EXPANSION KIT COMPAQ COMPATIBILITY

Most of the populer memory boards ellow you to edd an additional 64K, 128K, 192K, or 256K. The IBM64K Kit will populete these boards in 64K byte increments. The kit is simple to instell – just insert the nine 64K RAM chips in the provided sockets and set the two groups of switches. Directions are included.

IBM64K (Nine 200ns 64K RAMs). $49.95

INDUSTRIES

Protect Yourself...

DATASHIELD® Surge Protector

Eliminates voltage spikes and EMI-RFI noise before it can damage your equipment or cause data loss. Six month warranty. Power dissipation (100 microseconds): 1,000,000 watts

Model 100. . . . . $69.95

DATA SHIELD® Back-Up Power Source also available. Provides up to 30 min. of continuous 120VAC 60Hz power to your computer system (load dependent) when you have a black-out or voltage sag. Also eliminates voltage surges and unwanted noise.

PC200. . . . . $349.95

$10.00 Minimum Order — U.S. Funds Only
California Residents Add 6½% Sales Tax
Shipping — Add 5% plus $1.50 Insurance
Send S.A.S.E. for Monthly Sales Flyer!

Spec Sheets — 30¢ each
Send $1.00 Postage for your FREE 1984 JAMECO CATALOG
Prices Subject to Change

MasterCard Jameco ELECTRONICS VISA

1355 SHOREWAY ROAD, BELMONT, CA 94002
Phone Orders Welcome (415) 592-8097 Telex: 176043

CIRCLE 168 ON READER SERVICE CARD

EXTEND THE LIFE OF YOUR PC

Organize your copies of PC

Make your magazine collection a handsome addition to your decor. These durable library-quality cases and binders will protect and organize your collection, make individual issues easy-to-find. They're made of luxury-look leatherette over high-quality binder board. And both styles are custom-designed for this or any other magazine you save, with size, color and imprint selected by the publisher. FREE transfer foil is included for marking dates and volumes.

MAGAZINE BINDERS

hold your issues on individual snap-on rods, combining them into one volume. $7.95 each, 3 for $22.50, 6 for $42.95. Mixed titles OK for quantity prices.

OPEN BACK CASES

store your issues for individual reference. $6.95 each, 3 for $19.75, 6 for $37.50. Mixed titles OK for quantity prices.

For Faster Service CALL TOLL-FREE 1-800-526-0790 (In NJ only 201-540-0445)

PC P.O. Box 5120, Philadelphia, PA 19141

Please send ☐ Cases ☐ Binders

TITLE	QUANTITY

PAYMENT ENCLOSED $_____ *Add $1.00 per order for postage and handling. Outside USA add $2.50 per unit ordered. Send US funds only.

CHARGE MY: ($10 minimum) ☐ American Express ☐ Visa ☐ MasterCard

Card No._____ Exp. Date_____

Mr./Mrs./Ms._____
print full name

Address_____

City/State/Zip_____

*Residents of PA add 6% sales tax

THE GREATEST USER FRIENDLY STORY EVER TOLD

Scripture Scanner™ by Omega Software™ brings you the complete Bible on diskettes. Scripture Scanner is based on two important truths: first—The Bible is more than a book simply to be read; it is a **precious resource that should be used to its maximum advantage**, and second—the personal computer now gives us complete, instant access to the eternal, living, truths of God's Word.

Scripture Scanner provides a menu driven program with continuous HELP options which make it perfect for group or individual Bible study.

You may also:

- Document lesson plans, sermon notes, or your own "Spiritual Notebook" with your notes and verses retrieved from the Bible text.
- Insert scripture text into your own word processor files.
- Read, scan, print, or view two passages at the same time on a split screen.
- Create a reference library from your own Bible study or automatically create a topical reference library from a scan for key words or phrases.

Entire Bible $249.95 | **New Testament $159.95** | **Old Testament $129.95**

Demonstration Diskettes $15.

Requires 128K of memory and a single disk drive.

OMEGA SOFTWARE

P.O. Box 355 / Round Rock, Texas 78680-0355
Toll Free 1-800-531-5223 or 512-255-9569 in Texas

☐ VISA ☐ AMERICAN EXPRESS ☐ MASTER CARD

King James Version, Others Available Soon!
Now for IBM PC, PC-XT, PC Jr. and IBM Compatibles. Dealer inquiries welcome.

CIRCLE 279 ON READER SERVICE CARD

™ Scripture Scanner and Omega Software are trademarks of Omega Software, Inc.

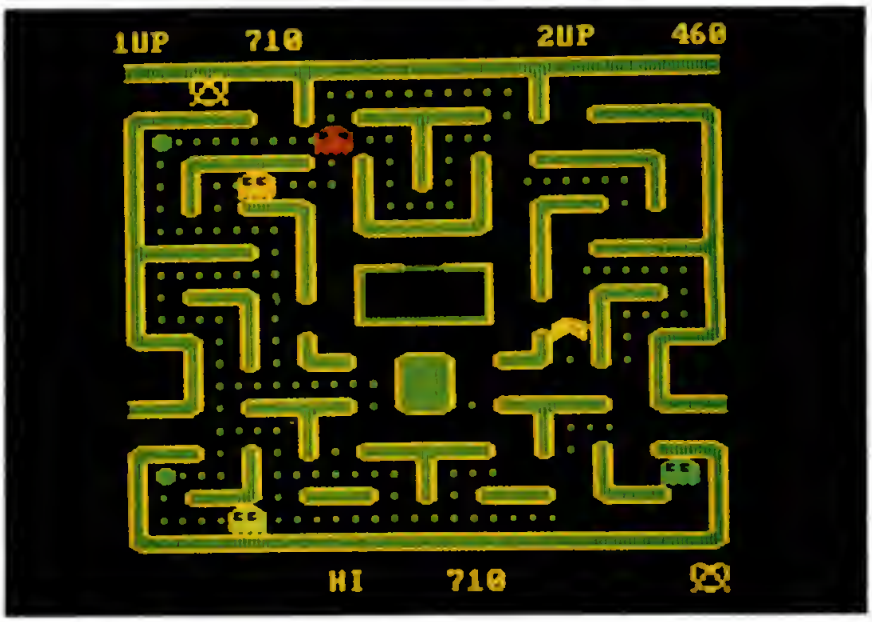
Pac-Man appearing on the screen after you complete each level. Each maze has several levels, with various special point bonuses for devouring extra goblins or goodies.

It's hard to pin down exactly what it is that gives *Ms. Pac-Man* her allure. She's just, shall we say, a bit more seductive than her male friend. It's a question of artistry, and, as noted earlier concerning *Hard Hat Mack*, you've either got it or you don't. Here's to you, *Ms. Pac-Man*—you're one classy dame.

On *PC Magazine*'s scorecard from 0 to 6, *Ms. Pac-Man* gobbles up a bunch of goodies:

FUN:	4.5
CHALLENGE:	4.5
COLOR/GRAPHICS:	4.5
TOTAL:	13.5

■



A *Ms. Pac-Man* screen showing the heroine busily chowing down.

Computer Control Systems

DEVELOPERS OF

FABS & AUTOSORT

HAVE ADDED ANOTHER FINE PRODUCT TO THEIR LINE OF *QUALITY* SOFTWARE: IT'S *SPEED* WILL AMAZE YOU! WRITTEN IN ASSEMBLY LANGUAGE.

DB-FABS | A DATA, SCREEN, REPORT MANAGER

Very easy for novice users in STAND-ALONE mode . . . Sophisticated RUN-TIME mode for programmers when used with MS BASIC INTERPRETER or COMPILER . . . Creates files/forms/reports . . . Fast keyed-access with B-Tree Indexing . . . High Speed sort on up to 10 fields w/select capabilities . . . Deleted file archive . . . Multiple file linking for detailed report generation . . . Fields can be indexed at any time . . . up to 64 fields per file with 255 chars per field, 8,160 chrs/rec, for 65,535 records . . . Preset conditions for data files, forms, keys . . . Automatic update for indexed files for additions/deletions/edits . . . All associated data files automatically changed when file edited/erased . . . Files/forms/reports easy to alter/edit/modify . . . Reports can be redirected to a disk file for use with word processor . . . Screen forms permit easy entry of data . . . Report generation extremely easy with many flexible features . . . Run-time mode will REVOLUTIONIZE programming for programmers . . . Generate reports from run-time . . . Sequence data files . . . Erase/create index files at will . . . Control video enhancements . . . Sort data files to create new data files/w/conditional output . . . Commands for full screen control if your Basic lacks this ability . . . Convert Basic data files to DB-FABS files and vice-versa during run-time . . . Easy tutorials for stand-alone and run-time modes . . . Manual written in simplistic style for ease in implementing . . .
For MS-DOS or PC-DOS on IBM-PC/XT, DEC Rainbow, Victor 9000, Sanyo and other computers.

RETAIL PRICE . . . $295 + SHIPPING **DEALER INQUIRIES WELCOMED**

COMPUTER CONTROL SYSTEMS, INC., 298 - 21st Terrace S.E., Largo, Florida 33541 (813) 586-1886

CIRCLE 192 ON READER SERVICE CARD

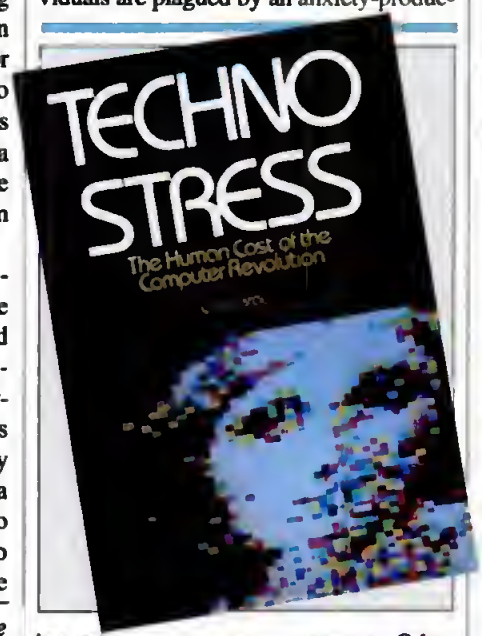
The Fruits of Technology: Stressing Solutions

Are you likely to suffer from "technostress"? Is it possible to get even more out of WordStar? The two books reviewed here may have the answers to these and other questions.

Here is a quick test to see if you're likely to become a victim of what Craig Brod calls "technostress": Do you spend many hours a day working at a computer terminal? Is your vision blurry after working at the computer for several hours? And most importantly, do you often find yourself relating to others and behaving more like a computer than a person? If you answer yes to any of these questions, you may be suffering from technostress.

According to Brod, a California psychotherapist, technostress results when the "delicate balance between people and computers is violated." In his book *Technostress: The Human Cost of the Computer Revolution*, Brod defines technostress as a modern disease caused by an inability to cope with computer technologies in a healthy manner. "It manifests itself in two distinct, but related, ways: the struggle to accept computer technology, and in the more specialized form of overidentification with computer technology."

With the first type of technostress, individuals are plagued by an anxiety-producing reluctance to use computers. Other symptoms of this type of technostress include irritability, headaches, nightmares, resistance to learning about computers, and an outright rejection of computer technology.



On the other hand, technostress can also occur among individuals who have "too successfully identified with computer technology." In this case, the computer becomes the core of a person's existence and that person loses the capacity to feel and relate to others.

Technocentered individuals exhibit a high degree of factual thinking, poor access to feelings, an insistence on efficiency and speed, a lack of empathy for others, and a "low tolerance for the ambiguities of human behavior and communications."

While the book's main focus is on the psychology of the interactions between individuals and machines, *Technostress* may also be of interest to managers who are integrating new technologies into their offices. Brod maintains that firms should develop humane policies that must recognize "the psychological needs of employees by taking into account the nature and the content of their assigned tasks." Brod also believes that employees should be allowed to decide for themselves when they need a break, since the traditional 15-minute coffee break is no longer enough "given the intensity of computer work."

Technostress recommends management take steps to ensure that the old lines of informal communications between workers are maintained. It is essential, says Brod, that organizations allow time for people to meet informally to "talk as they did prior to the introduction of computers."

Technostress: The Human Cost of the Computer Revolution
Craig Brod
Addison-Wesley Publishing Company
Reading, MA 01867
(617) 944-8660
Copyright: 1984
Cover Price: $16.95
ISBN 0-201-11211-6

CIRCLE 797 ON READER SERVICE CARD

BOOK REVIEW

Technostress provides a comprehensive overview of what computers may or may not be doing to the mental health of people who work with them. Brod describes the anxieties that may afflict all types of computer users and gives advice on how to avoid becoming a victim of technostress.—**Roy Katz**

Using the IBM PC: WordStar
C.J. Puotinen
Holt, Rinehart & Winston
385 Madison Ave.
New York, NY 10017
(212) 872-2000
Copyright: 1983
Cover Price: $17.45 (Also available with tutorial diskette for $40.45)
ISBN 0-03-062857-1

CIRCLE 795 ON READER SERVICE CARD

The best-selling computer program ever written, according to a recent *New York Times* article, is MicroPro's *WordStar*. There are many reasons why this word processing package is so popular, but its manual is not one of them. The original version of the documentation was so inscrutable that purchasers often had to buy one of the many independently published how-to-learn-*WordStar* books to get up and running. These books also sold well because there were hundreds of thousands of pirated copies of *WordStar* floating around the country—copies that came with no documentation whatsoever.

Most of the books concentrated on the fundamentals and did manage to teach users how to get started. Perhaps as a reaction to this aftermarket, MicroPro released a vastly improved edition of its manual at the end of 1983. While this new documentation was far from perfect, it covered the same territory as the aftermarket books, with the same essential clarity and cloying cuteness. And, of course, the new MicroPro manual did not leave anything out; the independent books usually glossed over many of the more powerful features of *WordStar*.

The latest tome to rehash the manual is a slick 367-page production from Holt, Rinehart & Winston, by C.J. Puotinen. It's called *Using the IBM Personal Computer: WordStar*. (After trying for several minutes to see if this name was an anagram of anything recognizable, I gave up.)

UTIPC:W uses an "at" sign (@) to mean "hit the Enter key." This is presumably because it is too hard to say "hit the Enter key." The explanation for this is buried in a section on using DOS, which

CALL TOLL FREE 1-800-528-1054

COMPUTER WAREHOUSE

PRINTERS
Brother
HR-25 $719
C. Itoh
8510 Parallel (Prowriter) $319
8510 BPI $389
F-10 Parallel $918
55 CPS Parallel $1199
Comrex
CR II Parallel $439
CR-III Call
Computers International
Daisywriter 2000 w/48K $985
Diablo
620API $739
630 API $1899
630 ECS/IBM $1995
Epson
All Printer Models Call
Inforunner
Riteman $249
Juki
6100 $425
NEC
2050 $769
3550 $1519
Okidata
All Printer Models Call
Panasonic
1090 Call
1091 Call
1092 Call

PRINTERS
Qume
Letter Pro 20 Parallel $629
11/40 W/IBM Interface $1389
11/55 W/IBM Interface $1869
Silver Reed
EXP400 Parallel $289
EXP500 Parallel $388
EXP550 Parallel $479
EXP770 Call
Star Micronics
All Printer Models
Tally
Spirit 80 $289
160L W/Tractor $589
180L W/Tractors $779
Toshiba
P1340 Parallel $725
P1350 Parallel $1445
P1351 Parallel $1459
Transtar
120 Parallel $395
130 Parallel $549

SPECIAL OF THE MONTH
HAYES
1200B Modem $420

QUADRAM
Quadlink $449
Quadboard 256K (Expands to 384K) $469
Quadboard II 256K (Expands to 384K) $469
MONITORS
Amdek
310 Amber $160
Princeton Graphic
HX-12 $469
DISKETTES
Elephant
5¼ DS/DD (Qty 100) $218
Maxell
MD-2 (Qty 100) $275
Scotch
5¼ DS/DD (Qty 100) $245

COMPUTERS
Eagle
PC+2 W/Eagle Adaptor & Monitor Call
Spirit 2 Call
Spirit XL Call
Sanyo
MBC-550 W/Printer $1199
MBC-555 W/Printer $1499
MBC-550-2 W/Printer $1399
MBC-555-2 W/Printer $1799
Zenith
All Z-150 & Z-150 Models Call
MODEMS
Hayes
Smartmodem 1200B See Special above

COMPUTER WAREHOUSE
2222 E. Indian School Rd. • Phoenix, Arizona 85016
Order Line: 1-800-528-1054
Order Processing & Other Information: 602-954-6109

Store Hours: Mon-Fri 10-5:30 Saturday 9-1 Order Line Hours: Mon-Fri 10-5:30 Saturday 9-1
Prices reflect 3% to 5% cash discount. Product shipped in factory cartons with manufacturer's warranty. Please add $8.00 per order for UPS shipping. Prices & availability subject to change without notice. Send cashier's check or money order.. all other checks will delay shipping two weeks.

Oh No!

Your only copy of vital data.

Lost. Gone.

The file erased or the disk damaged.

It happens to us all.

The solution?
File recovery with:

Norton Utilities™

Oops protection.

The Norton Utilities: a powerful set of tools that supplement DOS for the IBM/PC and compatibles. Works with all versions of DOS from 1.00 through 2.10 and beyond. Works on PC, XT, PCjr, Compaq, Compaq-plus, all fully IBM compatibles, and others.

- ***The Norton Utilities*** provide file recovery tools, and guidance to their use.
- ***The Norton Utilities*** provide disk exploration tools, that help you know and understand your PC better.
- ***The Norton Utilities*** provide other tools to help you use your PC.

Life insurance for your data.

File recovery
Disk exploration
Norton Utilities
and more!

VISA MasterCard

The Norton Utilities
are available from Computerland, and most software dealers.
Or you can order direct, for $80:

Peter Norton
2210 Wilshire Blvd.
Santa Monica, CA 90403

Telephone orders: (213) 399-3948
Visa and MasterCard welcome

CIRCLE 346 ON READER SERVICE CARD

PC DEMO

A Library of Software Demo Programs

We're getting noticed.

Hundreds of PC owners now subscribe to **PC-Demo**, the first and only software demo magazine on disk. Each month our subscribers receive:

- ☑ 3 to 5 software demo programs provided by major software publishers.
- ☑ a catalog of more than 100 demo programs that can be ordered individually.
- ☑ a discount coupon worth $6 off the purchase of software from a leading mail order house

Our rapidly growing library of software demo programs now includes

MicroCAD COMPUTER AIDED DESIGN	*Omnifile* SSR CORP
Four Point Graphics IMSI	*Cdex Training Programs* CDEX
ResQ KEY SOFTWARE	*Quickcode* FOX & GELLER
Harvard Project Manager HARVARD SOFTWARE INC	*The Next Step* EXECUWARE
Prokey ROSESOFT	*Concurrent DOS* DIGITAL RESEARCH
Thinktank LIVING VIDEOTEXT	*Microsoft Project* MICROSOFT
Home Accountant CONTINENTAL SOFTWARE	*Thor* FASTWARE INC
Integrated 6 MOSAIC SOFTWARE	*Multi-User dBase II* ASHTON TATE
PC/FORTH LABORATORY MICROSYSTEMS	*and many more*

Our price? **Less than $6 per month.** All you need is 64K RAM and one double-sided disk drive to sample the best newly-released software for the IBM PC and XT. Join the others and sign up for a 6-month subscription.

To subscribe, phone **(415) 974-5134** with Visa or MasterCard or send us the coupon below.

Please sign me up for the next 6 issues of PC-Demo at a cost of just **$35** (domestic), $38 (foreign).
Payment [ ] Check or M.O. [ ] Visa [ ] MasterCard
Card No. _____
Expiration Date _____
Signature _____
[ ] Tell me how I can get my software on PC-Demo
Name _____
Address _____
City _____ State _____ Zip _____

MAIL TO: **SOFT PEDDLE, 1724 Sacramento St. No. 444 San Francisco, CA 94109** PC

CIRCLE 348 ON READER SERVICE CARD

LISTEN to "The Voice of Experience"

SynPhonix™

Electronic Speech Articulator for the IBM-PC!

Hear at last, hardware synthesis at software prices. SynPhonix™ producee unparalleled voice quality using the ***all new SSI263*** phoneme eynthesizer with 64 phonemes, 100's of allophones, plus software controlled pitch, amplitude, rate and fliter. The SONIX™ 88© Speech Opereting System puts you in control of it ell. SynPhonix™ is brought to you by professionals with more than e decade of experience in speech syntheels products. Applications ere abundant. SynPhonix™ features include:

- SSI263 Phoneme Synthesizer
- Unlimited vocabulary
- High Quality Phonetic Voice
- Low Data Rate
- Singing/Sound Effects
- Free Spelling Program
- Demo Software Included
- Transparent to User's Software
- SONIX™ 88©
  - Speech Operating System
  - Speech Editor
  - Preprogrammed Vocabulary
  - Vocabulary File Manager
  - EASY TO USE
- 90 Day Limited Warranty
- Comprehensive User Manual

Artic Technologies
"The Voice of Experience"

Dealer inquiries welcome!
2234 Star Ct.-1B (313) 852-8344 Auburn Heights, Michigan 48057

IBM is a Trademark of International Business Machines

CIRCLE 244 ON READER SERVICE CARD

StatPac™

Statistical Analysis Package

A complete data manager and statistical analysis package similar to mainframe SPSS.*

StatPac's features include:
batch processing, variable and value labels, select if, recode, recode if, compute, compute if, sort cases, list cases, write subfile, frequencies, descriptive statistics, crosstabs & chi-square, correlation & linear regression, t-test for matched pairs or independent groups, multiple regression, one and two-way anova, two kinds of multiple variable response.

StatPac can handle fixed or free format data files and 5000 cases with up to 255 columns of information per case. Statistic selections and printing options are available on all analyses including graphics and paper saving ecology feature.

Walonick Associates
5624 Girard Av. S. **612-866-9022**
Minneapolis, MN 55419

The Quality Analysis Package for the Professional

*SPSS is a trademark of SPSS, Inc.

CIRCLE 460 ON READER SERVICE CARD

Your IBM PC deserves a service plan that's not just old hat!

INTRODUCING

A new, sensible way to buy maintenance protection for your IBM Personal Computer

The world of computing is chenging. As en IBM PC user, you obviously understand that. Decision Data understands that too, and has developed a maintenance protection plen for the IBM PC that provides the service coverage you'll need...and at the industry's lowest price. And then goes one step further by returning a portion of thet eireedy low cost it you don't use eli the service available to you!

Credit tor unused service. Unheard of in this industry. Untii now. Until Decision Date introduced PERFORMANCE COUPONS, fhe unique epproach to computer meintenence designed specitically tor the Personal Computer user.

For as little as $239 (PERFORMANCE COUPON maintenance protection for your basic IBM PC with unlimited memory, two floppy disks, monochrome monitor, and printer), you receive two PERFORMANCE COUPONS to use how and when you wish during the yeer. These practical coupons replace traditional annual service contract coverege — providing the seme options of on-site or welk-in/mail-in depot service, complete coverage of costs tor parts and labor on each service call, and 30-day service warranty on eech repair, but with one very important ditference: you receive the meinfenance protection you need at the price you want to payi

■ The security of a maintenance contract, but at e low, practical cost. ■ The quality, responsive service you need, with all time end material costs covered. ■ Credit for unused coupons. ■ A choice ot on-site or walk-in/meil-in depot service. ■ Coverage ot your compiete iBM PC system PLUS popular non-iBM peripherals and add-ins. ■ Peace of mind tor e very smaii piece of your maintenance budget.

Savings are extended even further for muiti-system users under our Coupon Pooling Program.

PERFORMANCE COUPONS might just be the right idea tor me.

☐ Please call me at once to discuss my IBM PC maintenance needs.

☐ Please send more information about PERFORMANCE COUPONS.

Name _____

Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Telephone _____

☐ Please tell me more about your Coupon Pooling Plan that multiplies the benefits of PERFORMANCE COUPONS. PC 87

FOR MORE INFORMATION ABOUT PERFORMANCE COUPONS. CALL TODAY: 800-223-3622 (in PA 800-222-2271).

Decision Data Computer Corporation

CUSTOMER SERVICE DIVISION
400 Horsham Road • Horsham, PA 19044
215-674-3300

CIRCLE 305 ON READER SERVICE CARD

many readers will skip over. Anyone who is not taking his computer out of the box for the first time should realize what that symbol is doing in every line, but you can be sure that hundreds of confused purchasers will wonder why they're getting nowhere or running into trouble. This is just plain stupid. There are other lapses sprinkled throughout, like stale raisins.

While the book does cover most topics fairly exhaustively and is written in passable English, it has two things wrong with it. It is dreadfully dull, dry as dust. Sorry, CJ—putting in a recipe for chicken enchiladas doesn't spice up interest sufficiently. And it is overwhelming. There is a vast quantity of information hurled out of its pages in a willy-nilly manner without regard for what is important. The book simply cries out for organization.

Still, *UTIPC:W* does a decent job of teaching the ropes, and it covers a lot of ground. It's far from perfect but is fairly handsome and complete. If you had to learn *WordStar*, you could do worse than to buy this book. And it's filled with quizzes and tests, so if that's the only way you can learn, this is the book for you.

This is an overwhelming book. There is a ton of information hurled out of its pages willy-nilly.

But what the world needs now is not one more of these. Instead, we need a book that would take you progressively through the thickest of *WordStar* commands and drop you off at any point with enough all-around knowledge to get what you want done. It would also be helpful to learn how to master some of the more important, little-used commands to which all such books give short shrift.

The most important thing of all is that *WordStar* in its present incarnation is a real pain to use. This book, like most others on the subject, pays virtually no attention to the many things you can do to make operating this program a pleasure rather than a chore. Maybe this information was supposed to go in the 13 blank pages at the very end of the book?—**Eric Berg**

Microshop
COMPUTER PRODUCTS

Low Prices ★ Low Prices ★ Low Prices ★ Low Prices

MONITORS

Amdek 300	$139.00
Amdek 300A	$159.00
Amdek 310A	$179.00
Amdek Color I	Best Price
Amdek Color II	Best Price
PGS - HX - 12	Best Price
PGS - MAX - 12	Best Price
PGS - SR - 12	Best Price

PRINTERS

Epson FX 80	$499.00
Epson FX 100	$699.00
Okidata 92 A	$465.00
Okidata 93 A	$765.00
Okidata ML 84	$950.00
Okideta 2410	Best Price
Toshiba P1351 & 1340	Best Price
NEC Spinwriters 3550	$1850.00
NEC Spinwriters 7730	$1999.00
C-Itoh Starwriter 40CPS	Best Price
C-Itoh Printmaster 55CPS	Best Price

Also available OX-1S, HR-2S , HR-3S & Starmicronics

DRIVES

Tandon TM 100-2	$215.00
Slimline Drives - Your Choice - Toshiba, Hitachi, Panasonic	$189.00

IBM PC INDIVIDUALLY CONFIGURED CALL FOR LOW PRICES

MULTIFUNCTION BOARDS

AST I/O +Ser & Par	$179.00
AST Six Pack 64K	$269.00
AST Mega Plus 64K	$269.00
AST Combo 64K	$269.00
Quadboard 64K	$269.00
Hercules Graphic	$359.00
Plantronics	Best Price
Paradise Multifunction Card	Best Price
Orchid - Blossom	Best Price
64K Ram Upgrade Kit	$50.00

MODEMS

Hayes Smart Modem 1200	Best Price
Hayes Smart Modem 200	Best Price
Hayes 1200B Plug in Modam Card	Best Price

HARD DISK FOR IBM PC

10 MB Hard Disk Sub System includes Software, Controller Cables, etc.

Internal	$999.00
External	$1099.00

Many other products available, Please call for low - low prices!

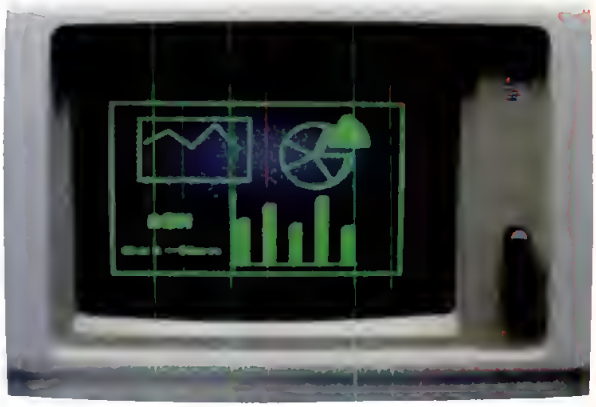
Microshop

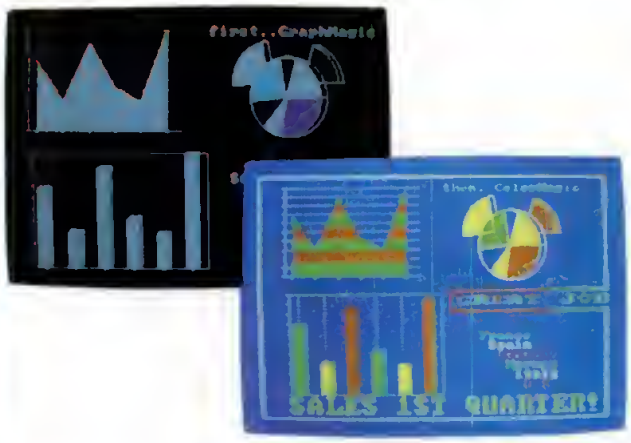
2640 Walnut Ave., Unit K, Tustin, CA 92680
(714) 838-7530, 838-7531, 838-7532
(714) 838-9503, 838-9504

Prices & availability subject to change without notice
IBM PC is a registered trademark of IBM Corp.

CIRCLE 337 ON READER SERVICE CARD

A picture is worth a thousand words. In color, maybe two thousand





...with ABM's $95 Col-Mon™

The Col-Mon™ (Color to Monochrome Adapter) is an interface module that plugs into the RGB output of the color card. It converts the signals from the IBM or compatible color board so graphics and text can be displayed on the IBM monochrome monitor.

Compared to the $499 Hercules Card, the $95* Col-Mon:™

- Runs all IBM Color/Graphics compatible software, not just a few programs.
- Can be configured so both a color and monochrome display work simultaneously.
- Doesn't use an expansion slot.

GraphMagic & ColorMagic are trademarks of Brightbill-Roberts & Co. Ltd. Lotus 1-2-3 is a trademark of Lotus Development Corp. Hercules is a trademark of Hercules Computer Tech. I B M is a Registered Trademark of I.B.M.

*Plus local dealer installation charges where applicable

...with ABM's ColorWizard™

The ColorWizard™ gives you both hardware and software to help you create professional business graphics, organizational charts and illustrations. Use GraphMagic™ to create them, then edit your graphs with ColorMagic™ to add stunning slideshow presentation quality.

- ABM Colorboard™—Totally IBM color/graphics adapter compatible board, that also provides output for shades of grey on composite monochrome monitors.
- GraphMagic™—Analysis Graphics that works with files from all popular spreadsheets such as Lotus 1-2-3™ and quickly creates business graphs (bar, line, pie or all three simultaneously) for output to any printer or plotter.
- ColorMagic™—A presentation graphics processor that lets you create and edit graphs like a word processor handles text.

Personality For Your PC

ABM COMPUTER SYSTEMS

3 Whatney, Irvine, California 92714
(714) 859-6531 TELEX 292427 ABM UR

CIRCLE 175 ON READER SERVICE CARD

ADVANCED COMPUTER PRODUCTS

Serving Computer Professionals Since 1976

TOLL FREE 800-854-8230

IBM PC

1984 CATALOG AVAILABLE SOON • 64K UPGRADE KITS - ONLY $50.00

64K UPGRADE - ONLY $50.00 • CUSTOM CABLES AVAILABLE

HARDWARE

AST Sixpakplus w 0K(SPC)	$229.00
Megaplus II w/0K(SC)	229.00
I/O Plus II (CS)	115.00
Game/Serial/Parallel Options	35.00
Monographics Graphics Card	445.00
CHALKBOARD	Call
COEX IBM PC Extender Card	29.00
IBM PC Prototype Card	36.00
DAVDNG Hard Disk Drives	Call
KENSINGTDN PC Saver	39.00
KEYBOARD IBM PC Compatible	149.00
KEYTRONICS 5150/5151 (PC&XT).	199.199
KDALA	99.00
KRAFT or TO	
IBM PC Joystick	59.00
Game Paddles	29.00
MICROSOFT Mouse	189.00
M&R PC/XT Exp Chassis (6 slots)	439.00
MOUSE SYS Mouse for PC	196.00
PERSYST Time Spectrum w/64K	289.00
PTI Back up Power 200/400W	328.00
QUADRAM Quadboard II w/0K	229.00
Quadlink (Apple Prog.)	479.00
Quaddisk (up to 72Mb)	Call
Microfazer MP64 w/64K	179.00
VISTA Multicard Plus DK	199
Maxicard w/64K (up to 576K)	229.00
PC Master (10 I/O)	329.00
Diskmaster (Floppy Cont.)	169.00
Dynaframe Hard Disk	Call
PC Clock I/O	129.00

PRINTERS/MONITORS

BROTHER HR-25P/25S	$799 819
HR-15P/15S	479 499
HR-35P or 35S	1089.00
COEX 80F/T (80cps)	Sale 899.00
DAISYWRITER 2000 (40cps)	1199.00
DTC Daisypnnter 380Z	11 59
DYNAX DX-15P/15S	529 549
DIABLO 630API/Serial	1890 2650
630 IBM/620 Ser.	2290 995
EPSON FX-80-100	849 739
RX-80-80FT	299 399
LQP-1500	1249.00
NEC Spinwriter 3550	1595.00
DKIDATA Model 82AP/83AP	339 926
Model 84P/84S	995 1049
Model 92P/92S	525 575
Model 93P 93S	799 869
Model 84 IBM	1039.00
Model 92/93 IBM	849 839
SILVER REED EXP500P	490.00
EXP550P	630.00
EXP770P	1049.00
TRANSTAR 315 (4 Color)	499.00
STAR Gemini 10X 15X	269 429
Delta 10/15 (160cps)	529 979
Radix 10/15	720 850
Powertype LQP	409.00
Call for New Star PC Compatible Family	
TOSHIBA	Call
SANYO PP5000LQ	399.00
AMDEK Video 300G A	145.00 155.00
Video 310A amber (IBM)	159.00
Color I (composite)	299.00
Color I Plus (earphin/nonglare)	329.00
Color II RGB (IBM) analog	449.00
Color II Plus	479.00
Color III RGB (IBM)	299.00
Color IV RGB (IBM) analog	779.00
BMC or ELKA 12" Green	89.00
PGS HX-12 RGB (690x240)	Call
SR-12 RGB (690x480)	Call
MAX-12 Amber	Call
SANYO 6500 Med-Res	269.00
7500 Hi-Res	369.00
TAXAN 400 RGB Med-Res	329.00
420 Hi-Res IBM	589.00
121 TTL Green/Amber	179.199
ZENITH ZVM-122 Amb 123 Grn	109 105
ZVM-131 13" Color	379.00
ZVM-135 Color Hi-Res	$19.00

DISKETTES

DYSAN 5¼" SS DD	10/$55	$28
DYSAN 5¼" DS DD	10/65	36
IBM 5¼" SS DD	10/60	43
IBM 5¼" DS DD	10/65	47
VERBATIM 525-01 SS DD	10/45	20
VERBATIM 550-01 DS DD	10/55	29
MAXELL MD1 SS DD	10/50	22
MAXELL MD2 DS DD	10/60	32
Flip Storage Box 5¼" (60 disks)		19
BULK SPECIAL SS	10/25	10
With Sleeve and Box	100/195	149

IBM ACCESSORIES

COMPUCABLE	
Keyboard/drive dust covers (set)	$10.00
CURTIS Tilt/swivel Monitor ped	43.00
PC Pedestal (IBM Mono)	59.00
PGS Quadchrome disp. Adapter	9.00
Vertical PC Stand	20.00
Mono Extension Cable	43.00
Keyboard Ext Cable	35.00
AC Plug Adpt (any mon. to PC)	8.00
EDP PROTECTION DEVICES	
The Lemon/Peach	39.00/63.00
The Orange/Lime	94.00/58.00
GILTRONIX SWITCH BOXES	
2 Way 9 Lines	90.00
4 Way 9 Lines	179.00
2 Way Centronics	199.00
RIBBONS	Each Dozen
Epson MX-80	5.75 59.00
Epson MX 100	10.95 120.00
Star Gemini 10/15	2.50 26.00
Okidata 80/82/83	3.59 44.00
Okidata 84/92/93	4.95 55.00
NEC 3550	11.95 135.00

SOFTWARE

dBASE II/Friday
$378.00/$168.00

Condor
$389.00

SuperCalc I/II/III
$79.00/$159.00/$228.00

Multiplan Vers. 1.1
$138.00

Microsoft Mouse/Word
$319.00/Call

Wordstar 3.3
$258.00

Micropro Pro Pak
$378.00

Rbase 4000
$328.00

T. K. Solver!
$268.00

PFS
File 88.00 Graph 88.00
Write 88.00 Report 78.00

Context MBA	**Call**
VisiOn	**Call**

Lotus 1-2-3 Vers. 1A
Call!

Bank Street Writer	58.00
Home Accountant Plus	88.00
Sideways	48.00
Volkswriter	114.00
Knowledge Man	274.00
Crosstalk XVI	108.00
Multimate w/spelling	348.00
Compuserve Subscription	38.00
Executive Info Serv.	78.00
Vidtex Software	58.00
Executive + Vidtex	118.00
Source Subscription	68.00
Source w/source link	108.00

MODEMS

BIZCOMP Model 2120 (Internal)	449.00
HAYES Smartmodem 1200	$529.00
Smartmodem 1200B (w Smartcom II)	429.00
Smartmodem 300	219.00
Smartmodem II	99.00
Smartmodem/IBM Cable	25.00
NOVATION Access 1-2-3	388.00

★ COLOR SPECIAL ★
THE COLOR GRAPHICS CARD
(same designer as Colorplus Card)
PRICE BREAKTHRU! 1 year Warranty
$229.00 **$229.00**

MULTI CARD II™ (exp. 0K-384K) $199.00

(INTRODUCTORY OFFER)

Advanced Computer Product's best selling multifunction card for the IBM PC & XT (plus compatibles) now has been improved with expansion capability to a full 384K and at no cherge an additional game port. You also get Print Spooler and Disk Emulation Software plus a full year SWAP-OUT Werranty at no extra cherge. Why pay more when you can get the same function and performence as Quedboard II™ end AST Sixpak Plus™ for substantially less money. You compare! Try it at no obligetion. 10 day no questions asked return privilege.

FUNCTION	Multicard II	Quadboard II	Sixpak Plus
Memory	0 to 384K	0 to 384K	0 to 384K
Parallel/Serial	Yes	Yes	Yes
Clock/Calander	Yes	Yes	Yes
Game Port	Yes	Yes	No ($50 list Opt.)
Software	Yes	Yes	Yes
Warranty	1 Year	1 Year	1 Year
ACP Price with 0K	199.00	229.00	229.00

EXPANSION MEMORY

- **64K Upgrade** (Set of 9 64K RAMS).... $50.00
- **256K RAM's** (256K x 1)..... $79.00 ea
- **16K RAM's** (16K x 1) ..... 10/$9.99
- **8087 CPU** (Arithmetic Processor) $199.00

IO/XT (Serial, Parallel, Clock/Calendar) ... $129.00

The most populer expansion card for the short slot of your IBM XT. All these functions on one card optimized to fit in one slot. 1 year warranty.

COLOR/GRAPHICS/COLOR/GRAPHICS

• Plantronics COLORPLUS™	$399.00	• Amdek MAI	$438.00
• Hercules GRAPHICS CARD	$369.00	• Hercules COLOR CARD w/Par port	$229.00
• Graphics X Software	$42.00	• Paradise MULTIDISPLAY	$378.00
• Quadram QUADCOLOR I&II	$199/Call	• CONOGRAPHIC CARD	$895.00
• Scanoptik COLORGRAPHICS	$269.00	• MA Sys PEACOCK	$299.00

IBM PC COMPATIBLE DISK DRIVES

Tandon TM-100-1 Single Sided (160K)	$169.00
Tandon TM-100-2 Double Sided (320K)	199.00
Control Data 9409 Double Sided (320K)	224.00
TEAC* 55B ½ high Double Sided (320K)	189.00
Toshiba* ½ high Double Sided (320K)	169.00
***IBM PC** Mounting Hardware for ½ highs	4.95
Vista "Diskmaster" 5¼" & 8" Diskcontroller	169.00

ACP has on hand several hundred demo 5¼" and 8" disk drives from virtually **all** manufacturers
Most are priced at **$99.00 ea.** Call for current availability

TERMS: We accept VISA MC MO Cashiers and Personal checks. School and Company PO's. We do not charge your card until we ship. Personal checks require drivers license and credit card #. **No Surcharge Added on VISA or MC.** COD's over $500 require 20% deposit with order. Add 3% shipping and handling for UPS. We offer same/day shipment. Prices subject to change without notice. We reserve the right to substitute manufacturer. We are not responsible for typographical errors. **Retail Sale Prices May Vary.** IBM™ trademark of International Business Machines. Quadboard II™ trademark of Quadram Corp. Sixpak Plus™ trademark of AST Research Inc.

MAIL ORDER: P.O. Box 17329 Irvine, CA 92713
Retail: 1310 E. Edinger, Santa Ana, CA 92705
(714) 558-8813
542 W. Trimble, San Jose, CA 95131
(408) 946-7010

TOLL FREE
800-854-8230
TWX
910-595-1565

WE STOCK CABLES • RIBBONS • DISKETTES • SPARE PARTS

CIRCLE 113 ON READER SERVICE CARD

With T.I.M.® IV, Your Micro is Bigger Than You Thought.

Make no mistake about it, T.I.M. IV is not just another update. It's a brand new version of the popular data base for executives. In fact, T.I.M. IV will make your microcomputer more powerful and versatile than you ever thought possible.

For openers, T.I.M. IV has relational capabilities. That means saving time because now a single entry allows the computer to work with other files simultaneously. And T.I.M. IV also has a special menu by-pass routine. It's perfect for the sophisticated user who wants to get down to business quickly.

In addition, the designers of T.I.M. IV have made it easier than ever to handle tasks like generating mailing and customer lists, tracking inventory and accumulating invoice records. T.I.M. IV can even take on basic accounting functions.

But with the changes, T.I.M. IV still retains its plain English commands and interface compatibility with VisiCalc®, MultiPlan™, 1-2-3™ and SuperCalc™ II systems. No wonder so many Fortune 1000 companies continue to select T.I.M.

See all of T.I.M. IV's new features at your local computer dealer. You'll be pleasantly surprised at just how big your computer really can be...

Be sure to ask your dealer about FAST GRAPHS, the full color business graphics package and FAST FACTS, the filing system for both home and business executives.

Innovative Software's products are at Computerlands®, Computer Marts, Entre Computer Centers℠, Xerox Stores, Sears Business Centers and other quality dealers. For information call **1-800-255-0470.**

CIRCLE 272 ON READER SERVICE CARD

INNOVATIVE™ Software

developers of practical businessware for the executive.

9300 W. 110th St., Suite 380
Overland Park, KS 66210 USA
913/383-1089 •Telex: 209542
800-255-0470

Announcing the sudden obsolescence of the floppy disk.

NEW HELIX PC BUBBLE DISK™

HALF-MEGABYTE MEMORY BOARD

The first bubble memory board for IBM PC/XT and compatible computers.

- NON-VOLATILE: You don't lose data when there is no power.
- Eight times faster than a floppy disk.
- For fixed or portable use without need for back-up storage.
- Impervious to dust, dirt, humidity, cold— as reliable in the North Sea, the Sahara, a Space Station, as in your office.
- Mean time between failure (MTBF) more than 20 years.
- Rugged enough to withstand vibration and shock up to 200Gs.
- For complete details, contact HELIX

HELIX

Helix Laboratories, Inc.
8123 Remmet Ave., Canoga Park, CA 91304
(818) 710-0300—outside California, 800-468-0004
Dealer Inquiries Welcome

© 1984, Helix Laboratories, Inc.

CIRCLE 247 ON READER SERVICE CARD

Micro-Biology

A PC and MICROBE, a program written to keep track of patient specimens and results, have taken over the information-management functions of a microbiology lab.

The influx of computers into hospital clinical laboratories has turned into a flood within the last few years. Lab sections with many repetitious procedures were the first to switch to microprocessor control of instruments. In contrast, work in the microbiology section, which determines if a patient specimen is infected, remains largely manual. The major requirement for computer assistance in this situation is not equipment automation but rather information management.

With this insight in mind, I wrote MICROBE, a system of eight programs, to handle the data input and reporting functions of the microbiology laboratory at the University of New Mexico Hospital/ Bernalillo County Medical Center. The present version of MICROBE has been in use for about 9 months. I wrote it specifically to take advantage of the XT's 10 megabytes of data storage, speed of operation, and versatile function keys. The system's specific operations are separated into modules. MICROBE's capabilities include specimen accessioning, results entry, quick search for recent results, extended search for investigations such as epidemiology and cumulative sensitivities, modification and deletion of records, purging of negative data, backup of old

data to cumulative files, and generation of worklists sorted by type of test or culture.

The microbiology section receives approximately 150 cultures per day and averages 40 positive results. Each culture is identified by a unique accession number, the patient's name, the location within the hospital, and the source of the specimen. Previously this information was entered into log books by hand, but now the specimens are logged through the lab with MICROBE's accessioning module, which is invoked from the main menu. This module recovers a few common variables from a CONTROL file maintained on the disk. The CONTROL file contains the last logical record numbers used in the data files and the last accession numbers used for each type of culture or test.

Accessioning, like all of the MICROBE modules that require keyboard input, employs an input template to maximize the accuracy of data entry (see Figure 1). The valid input for each field is different, so a prompt appears on the last six lines of the screen to remind you of the restrictions or type of input expected.

When the code identifying the type of test is entered in the accession number field, the program displays the next number for this test series and waits for you to press a cursor movement key or the Enter key. The source codes are a set of 85 anatomic locations used to describe the site of origin of the specimen. After you have typed the second digit of this code into its field, the text translation immediately appears below it.

The input screens are made flexible by a subroutine, initiated with the F10 key, that reads data directly from the screen and validates it. The routine itself is very short, as shown in Figure 2. It requires only the row, column, and length of the input field on the screen, and it calculates the offset into video RAM. PEEK is used to exam-

Illustrations: Michael Ng

FAST SIDEWAYS PRINTING FOR YOUR EPSON

Now you can print multi-page **spreadsheets** or reports as wide as you like on your FX printer, **sideways** on your paper, in a choice of five different type sizes, at **full text-mode speed.** And you can print in super-fast two-pass dot-matrix **letter quality**. Or create a printer buffer of up to 32K.

Printer Boss™ software also allows full menu-based operation of all control functions of all of the Epson MX, FX and RX printers. **Select** and deselect pica, elite, compressed, italic, enlarged, emphasized, doublestrike, underline, superscript and subscript. **Set** line spacing, right and left margins and skip-over-perforation. **Load** USA, France, Germany, England, Denmark, Sweden, Italy, Spain and Japan language sets. **Control** unidirectional, half-speed and proportionally-spaced printing. **Store and retrieve** 10 complete menu settings with a few keystrokes. **Emulate** the IBM-label printer for the IBM-PC, eliminating character printout incompatibilities between IBM-PC software and Epson FX printers while retaining full printer versatility. **Download** to FX printers five different **IBM character sets,** including graphics symbols, greek symbols, screen and APL characters. Print at full text-mode speed. **Ideal** for **IBM graphics** software, or **screen dumps,** or printing text from **Wordstar, Lotus 123** or many other fine programs.

Printer Boss™ for the IBM-PC and compatibles $59.95. With Letter Boss™ letter quality or Sidekick™ sideways print option $99.95. With both $139.95. Visa, MC, or send check. Free info. Dealers welcome

Printer Boss™

CONNECTICUT SOFTWARE
30 WILSON AVENUE
ROWAYTON CT 06853
203-838-1844

SIDEKICK IS NOT TO BE CONFUSED WITH SIDEWAYS. A TRADEMARK OF FUNK SOFTWARE. PRINTER BOSS, LETTER BOSS AND SIDEKICK ARE TRADEMARKS OF SPEER RESEARCH CORPORATION. WORDSTAR AND LOTUS 123 ARE TRADEMARKS OF MICROPRO INT L CORP AND LOTUS DEVELOPMENT CORP RESPECTIVELY

CIRCLE 318 ON READER SERVICE CARD


```
                        Accession No.: ....

                        Name: ................

                        Hospital No.: ......

                        Ward: ...

                        Source Code: ..



M1C      P1C      S1C      NBI      RBR      ER       B&T
3W       3E       4S       4W       5W       5S       5E
OP1      OP2      OP3      OP4      OP5      L&D      M&I
CT       FPC      ARP

              F1 Main Menu          F10 File Data
```

Figure 1: *Accession module input template. The prompt displayed is for field 4.*

```
10000 SCLEN$= LENGTH(CUR$): ROW$= Y$(CUR$): COLMN$= X$(CUR$)
10010 START$= ((ROW$-1)*160)+(2*(COLMN$-1)): STP$ = START$ +
((SCLEN$-1)*2): SCREN$=""
10020 FOR I = START$ TO STP$ STEP 2
10030 S$ = CHR$(PEEK(I)): IF S$= "." THEN 10040 ELSE SCREN$=
SCREN$ + S$
10040 NEXT I: RETURN
```

Figure 2: *This subroutine reads data from the screen and validates it where possible.*

ine the locations, the values are converted from ASCII codes to letters using the CHR$( ) function, and the results are concatenated as the response string for the field. Video memory begins at location 0B000H for the monochrome display and is 4,000 bytes long. Two consecutive bytes are required for each character displayed: the ASCII code for the character and the "attribute" of that character (for example, reverse video, bright or normal intensity, blinking or not).

For our purposes, only the character code is important, so the routine examines only the even-numbered bytes. Each field is examined in turn, and the routine assigns the data it reads from the screen into unique string variables upon return. After the subroutine reads the data from the screen, it validates each field if possible. If it discovers an error, it positions the cursor in the correct field and displays an error message in the prompt lines.

The time required to obtain microbiologic test results varies from a few hours to 6 weeks, depending on the type of test. Most results are negative, but those that are positive may have multiple organisms. The Results Entry module accommodates all of these situations. We report the negative cultures for a particular day as a batch by entering only the accession numbers via the keyboard. Into each record the program locates, it places a negative code in the Organism field as well as the current date and time in the Date Out field. If the program misses some records, it generates a printed list of "lost" records so that corrective action may be taken.

We enter positive results individually by specifying the date received and entering the accession number. When the program finds a record, it displays it for confirmation, which must occur before results can be entered. The program automatically places time and date in the Date Out field and positions the cursor in the Organism field. You can then enter codes for the organism, the amount of growth, and sensitivities to antibiotics.

The organism codes are local codes ranging between 100 and 500, with the value 550 reserved for negative results. After you have entered the third digit of this code, the test translation appears on the screen and you can correct it if necessary. Antibiotic sensitivities are recorded using a 1,2,3 code representing resistance, sensitivity, and intermediate sensitivity, respectively. Certain organisms have been designated locally as epidemiologically significant, and any organism isolated from the fluid surrounding the brain is deemed significant. The program notes and flags these events on the record, and the notes may be retrieved later.

Multiple organism isolates from one specimen are recorded by pressing the F8 key. The positive record that the program last located will appear with its result fields blank.

No matter how carefully you enter the data, mistakes will eventually creep into any database. The modification module allows you to correct errors or even delete data from the system. In addition, slow growth of some organisms in a culture may require the addition of further data in the Organism field after the primary results have been entered; the modification module allows for this also.

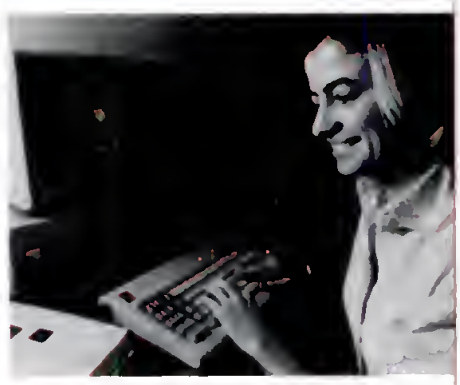
An input template similar to the accessioning screen lets you specify multiple search keys in order to locate a particular record. The program will display records matching the criteria on the screen. You select the proper record by positioning the cursor with the arrow keys and then pressing F5 to begin the modification sequence, which allows you to delete, change, or add to the displayed record.

I wrote the MICROBE database to accomplish several goals: ease of use for computer novices, flexible input, and input verification. In the next issue, I'll explore the versatility and power of MICROBE's data retrieval modules. ■

Dean Madar is a resident in pathology at the University of New Mexico Hospital/ Bernalillo County Medical Center.

PC LOGO™

When you're really serious about ***LOGO***



Whether you are a first-time computer user or an experienced programmer, PC Logo offers you features not available on other versions of Logo for the IBM PC, like a search and replace function in the editor. What's more, since it requires 64K of memory, only PC Logo will run on the IBM® PC, PCjr and the IBM PC compatibles. Compare:

	PC Logo	DR. Logo	IBM Logo
Operating System	DOS	CP/M	DOS
Minimum Memory Requirement	64K	192K	128K
Utility Disk	YES	NO	NO
Medium and high resolution graphics	YES	NO	NO
Compatible w/8087 chip	YES	NO	NO
Hard Disk	YES	NO	NO
Price	149.95	149.95	175.00

So why settle for the ordinary? Ask for PC Logo at your software dealer or contact: Harvard Associates, Inc., 260 Beacon Street, Somerville, MA 02143 Telephone (617) 492-0660.

IBM is a registered trademark of International Business Machines Corp
DR. Logo is a trademark of Digital Research Inc

CIRCLE 198 ON READER SERVICE CARD

New Release 4.1

Microstat®

We've continually improved Microstat since it was introduced in 1978, and the latest release includes many new features you've wanted.

- Interactive and Batch Processing
- Expanded Data Management Subsystem with New Data Transforms
- Reading data files created by other programs
- 3 types of Analysis of Variance
- Time Series
- Crosstabs and Chi-Square
- Factorials, Permutations, and Combinations
- Hypothesis Tests
- Data sets that can exceed memory
- Multiple Regression (including Stepwise)
- Scatterplots (including best fit regression)
- Correlation Analysis
- 12 Nonparametric tests
- 8 Probability Distributions
- Descriptive Statistics
- Easy Installation

Microstat's algorithms have been designed to prevent numeric overflow errors and yield unsurpassed accuracy. Microstat's price is $375.00 including the user's manual and is available for the Z80, 8086, 8088 CPU's and CP/M80, CP/M86, MS-DOS, and PC-DOS. To order, call or write

ECOSOFT INC.

6413 N. College Ave. • Indianapolis, IN 46220
(317) 255-6476

VISA MasterCard

Trademarks: Microstat (Ecosoft), CP/M (Digital Research), MS-DOS (Microsoft), PC-DOS (IBM), Z80 (Zilog), 8086, 8088 (Intel).

CIRCLE 320 ON READER SERVICE CARD

CompuSave

COMPUTERS

IBM PC **$2389**
64K, 2-320K Drives, Basic A & Guide to operation. Controller Card. Keyboard.

COLUMBIA MPC **$2499**
1600-1 with Super 3000 Software, Computer Package

EAGLE COMPUTER (all models).. $CALL
NEC COMPUTER (all models).... $CALL

MONITORS

PRINCETON GRAPHICS

HX-12 ..... **$ 469**
Hi Rez RGB Color Monitor

AMDEK COLOR II ..... $ 429
AMDEK 300 (green) ..... $ 136
AMDEK 310 (green or amber) ..... $ 179
TAXAN RGB VISION 420 ..... $ 449
Hi Rez RGB Color Monitor
TAXAN MONOCHROME (green or amber) ..... $CALL
NEC JC-1203 ..... $ 589
Hi Rez RGB Color Monitor
NEC JB-1201 ..... $ 159
Hi Rez Monochrome
SONY KX-1211 HG PROFEEL ..... $ 699
Hi Rez RGB/Composite Video Color Monitor/TV
SONY PVM 1270 Q ..... $ 879
Super Hi Rez RGB/ Composite Video Color Monitor
SONY 19", 25", 46" ..... $CALL
RGB/Composite Video Color Monitors
SONY-IBM or -APPLE INTERFACES ..... $CALL

SPREADSHEETS FINANCIAL - GRAPHS

LOTUS 1-2-3 ..... **$ 319**
MULTIPLAN ..... $ 177
VISICALC ..... $ 169
ACCOUNTING PLUS ..... $ 349
FINANCIAL PLANNER ..... $ 409

DRIVES / HARD DISKS

TANDON 100-2 ..... **$ 229**
CDC 320K DRIVE $239
PEGASUS HARD DISK ..... $CALL

PRINTERS

EPSON FX-100 ..... **$ 729**
EPSON (RX-80, MX-80FT, FX-80, MX-100) ..... $CALL
SILVER REED 770 ..... $949
DYNAX 15 ..... $529
DIABLO 620 ..... $ 929
DIABLO 630 ..... $CALL
OKIDATA 92 ..... **$ 439**
OKIDATA 82, 83, 84, 93 ..... $CALL
NEC SPINWRITER 3550 ..... **$1699**
NEC (all models) ..... $CALL
MANNESMANN TALLY MT 180L.. $739
MANNESMANN TALLY, "QUME" (all models) ..... $CALL

MODEMS

HAYES 1200 ..... **$ 489**
HAYES 1200B ..... **$ 429**
HAYES 300 ..... **$ 205**

COLOR GRAPHICS CARDS MULTI-FUNCTION

PLANTRONICS COLOR PLUS **$379**
USI MULTI-FUNCTION $349
Color Graphics, Monochrome, Parallel Port, 32K
AMDEK MAI ..... $ 459
640x400 Color Graphics Monochrome, Parallel Port, etc.
TECMAR GRAPHICS MASTER ..... $CALL
AST RESEARCH SIXPAK PLUS **$269**
AST RESEARCH MEGAPLUS, COMBOPLUS, PC NET $269

WORD PROCESSING DATA BASE

WORDSTAR/SPELLSTAR/ MAILMERGE/STAR INDEX ..... **$ 379**
MULTIMATE ..... $ 319
WORDSTAR ..... $ 257
SPELLBINDER ..... $ 249
INFOSTAR ..... $ 269
dBASE II ..... **$ 379**
dGRAPH ..... $ 189
QUICKCODE ..... $ 179
THE WORD w/MOUSE $349

COMPUSAVE ..... (800) 545-SAVE

In California Call ..... **(800) 841-SAVE**

Sunnyvale, Ca ..... **(408) 747-1244**

Prices effective through May 31, 1984

CIRCLE 457 ON READER SERVICE CARD

Trainerless Training: Drifting Off Course

Cdex's new PC training package severely restricts user input and presents screen after uninterrupted screen of text. It has lost sight of the principles of interactive courseware.

Good courseware that makes use of the computer's strengths can be a better teaching tool than even the best textbook—especially for teaching computer skills. But bad courseware is an ineffectual substitute for a book. Cdex's new training package, entitled *How to Use Your IBM Personal Computer with PC DOS*, sounds like a marvelous—if circular—idea: Use your PC to teach yourself how to use your PC. But a number of poor choices by the designers make this a frustrating program to learn from.

The courseware appears to be written in Pascal and runs—ironically enough—not under PC-DOS but under the UCSD p-System. It consists of four disks and a 69-page, spiral-bound reference guide, which is divided into five major sections: Introduction, User Instructions, Keyboard Function Reference, DOS Command Reference, and Exercises.

How to Use Your IBM Personal Computer With PC DOS
Cdex Corp.
5050 El Camino Real
Los Altos, CA 94022
(800) 982-1213
(415) 964-7600
List Price: $69.95
Requires: 64K RAM, one disk drive.

CIRCLE 798 ON READER SERVICE CARD

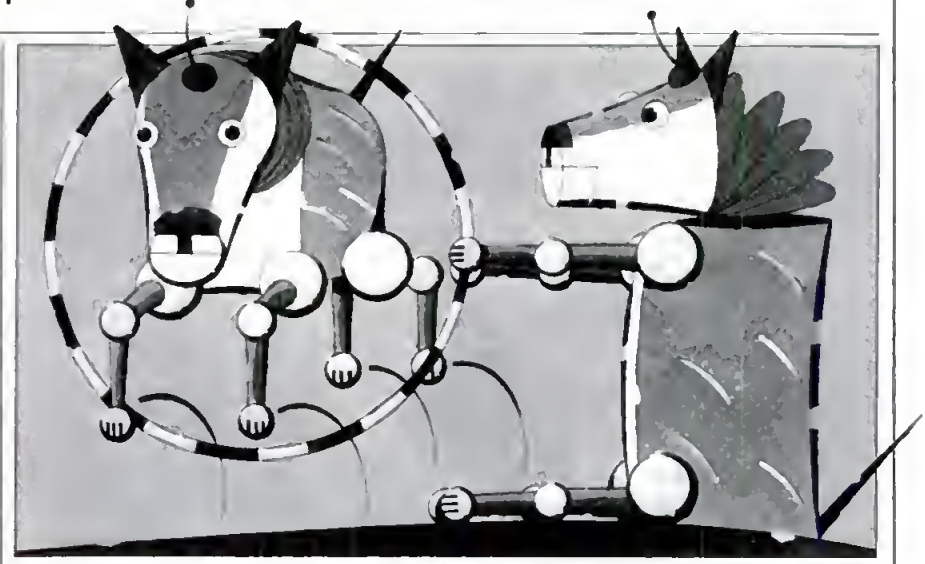


Illustration: Philip Anderson

You move through the courseware by using a main menu to access each of the 11 major sections. The "option bar," a submenu that appears on individual displays within each section, offers movement and response choices.

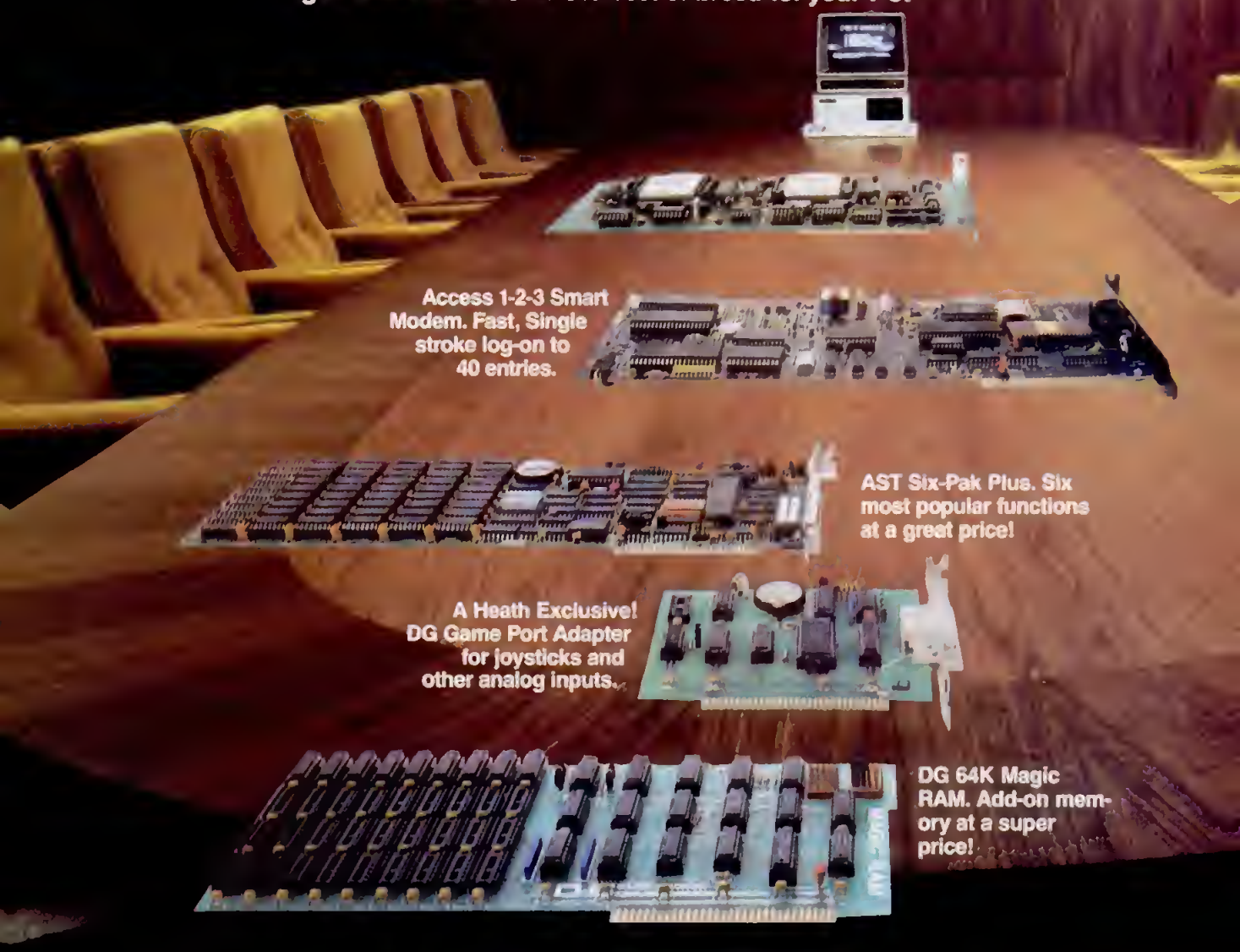
Each major section begins with a summary display previewing the topics to be covered. The basic structure of each section is a tutorial followed by a brief quiz consisting of one to six questions, typically multiple choice. In some quizzes the program will supply the correct answer after several wrong responses. In other cases, however, you can arrive at the correct answer only by a process of elimination. Hint, Skip, and Review options are available in some but not all questions.

The program's organization and physical layout are its strong points. The main menu allows direct access to and return from all sections. No selection order is prescribed or enforced; you can choose sections in any order and return to them as frequently as you desire. The display format is clean, consistent, and well organized. Every display is labeled with the name of the section and the current topic. Available options appear across the bottom of the screen. Option key assignments are usually logical and mnemonic; for example, pressing M sends you to the main menu.

(continued)

Heath enters the board room

Now you can buy the finest PC compatible boards, accessories and software from a single, trusted source. The Heath Company. We guarantee these to be the *best of breed* for *your* PC.



Access 1-2-3 Smart Modem. Fast, Single stroke log-on to 40 entries.

AST Six-Pak Plus. Six most popular functions at a great price!

A Heath Exclusive! DG Game Port Adapter for joysticks and other analog inputs.

DG 64K Magic RAM. Add-on memory at a super price!

NEW MS-DOS* Course
Now you can learn the operating system of the IBM and Zenith Date System PC's. Complete step-by-step self-study course shows you how.
*MS-DOS is a registered trademark of MicroSoft Corporation

When you buy PC compatible boards, you want them to work with no problems, no delays. Now Heath has taken the guesswork out of who has the best computerware at the right price. Heath has done the testing and evaluating for you and we offer nothing but the finest boards and accessories. And we back them all with our own 90 day money-back guarantee. So, forget the guesswork. Buying the best is easier...because the best comes from Heath.

Heath®/Zenith®
Heath Company

See and buy the finest boards and other accessories for your Heath/Zenith or IBM PC.

Find them at these Heathkit Electronic Centers:

- **PHOENIX, AZ** 2727 W. Indian School Rd.
- **TUCSON, AZ** 7109 E. Broadway
- **ANAHEIM, CA** 330 E. Ball Rd
- **CAMPBELL, CA** 2350 S. Bascom Ave
- **EL CERRITO, CA** 6000 Potraro Ave.
- **LA MESA, CA** 8363 Center Dr.
- **LOS ANGELES, CA** 2309 S. Flower St.
- **POMONA, CA** 1555 N. Orange Grove Ave
- **REDWOOD CITY, CA** 2001 Middlefield Rd
- **SACRAMENTO, CA** 1860 Fulton Ave
- **WOODLAND HILLS, CA** 22504 Ventura Blvd
- **DENVER, CO** 5940 W. 38th Ave.
- **AVON, CT** 395 W. Main St., (Rt. 44)
- **JACKSONVILLE, FL** 8262 Arlington Expressway
- **MIAMI, FL** 4705 W. 16th Ave., Hialeah
- **FT. LAUDERDALE, FL** 7173 W. Broward Blvd. Plantation
- **TAMPA, FL** 4019 W. Hillsborough Ave
- **ATLANTA, GA** 5285 Roswell Rd
- **PEARL CITY, HI** 98-1254 Kaahumanu St
- **CHICAGO, IL** 3466 W. Devon Ave
- **DOWNERS GROVE, IL** 224 Ogden Ave
- **INDIANAPOLIS, IN** 2112 E. 62nd St
- **KANSAS CITY, KS/MO** 5960 Lamar Ave., Mission, KS
- **NEW ORLEANS, LA** 1900 Veterans Memorial Hwy
- **LOUISVILLE, KY** 12401 Shelbyville Rd
- **BALTIMORE, MD** 1713 E. Joppa Rd
- **ROCKVILLE, MD** 5542 Nicholson Lane
- **PEABODY, MA** 242 Andover St. (Rt. 114)
- **WELLESLEY, MA** 165 Worcester Ave. (Rt. 9)
- **FARMINGTON HILLS, MI** 29433 Orchard Lake Rd. (At 13 Mile Rd.)
- **EAST DETROIT, MI** 18149 E. Eight Mile Rd
- **ST. JOSEPH, MI** Lakeshore Dr.
- **MINNEAPOLIS, MN** 101 Shady Oak Rd., Hopkins
- **ST. PAUL, MN** 1645 White Bear Ave.
- **ST. LOUIS, MO** 3794 McKelvey Rd., Bridgeton
- **GREENSBORO, NC** 4620C W. Market St.
- **OMAHA, NE** 9207 Maple St.
- **ASBURY PARK, NJ** 1013 State Hwy. 35, Ocean
- **FAIR LAWN, NJ** 35-07 Broadway, (Rt. 4)
- **BUFFALO, NY** 3476 Sheridan Rd., Amherst
- **JERICHO, LI, NY** 1S Jericho Turnpike
- **ROCHESTER, NY** 937 Jefferson Rd
- **N. WHITE PLAINS, NY** 7 Reservoir Rd
- **CINCINNATI, ON** 10133 Springfield Pike Woodlawn
- **CLEVELAND, OH** 28100 Chagrin Blvd.
- **COLUMBUS, OH** 2500 Morse Rd.
- **TOLEDO, ON** 48 S. Byrne Rd
- **OKLANDMA CITY, OK** 2727 N.W. Expressway
- **FRAZER, PA** 630 Lancaster Pike (Rt. 30)
- **PHILADELPHIA, PA** 6318 Roosevelt Blvd.
- **PITTSBURGH, PA** 3482 Wm. Penn Hwy
- **WARWICK, RI** 558 Greenwich Ave
- **DALLAS, TX** 2715 Ross Ave
- **FORT WORTH, TX** 6825-A Green Oaks Rd
- **NORTH HOUSTON, TX** 5050 FM 1960 W. (#126)
- **HOUSTON, TX** 1704 W. Loop N
- **SAN ANTONIO, TX** 7111 Blanco Rd
- **SALT LAKE CITY, UT** 58 East 7200 South, Midvale
- **ALEXANDRIA, VA** 6201 Richmond Hwy
- **VIRGINIA BEACH, VA** 1055 Independence Blvd.
- **SEATTLE, WA** 505 8th Ave. N.
- **TUKWILA, WA** 15439 53rd Ave. S
- **VANCOUVER, WA** 516 SE Chaklov Dr. (# 1)
- **MILWAUKEE, WI** 5215 W. Fond du Lac

*Units of Veritechnology Electronics Corporation.

For more information write:

Heath Company
Benton Harbor, MI 49022
OR CIRCLE READER SERVICE NUMBER

CB-101

CIRCLE 266 ON READER SERVICE CARD

One Pace for All

Cdex claims that its courseware allows you to work at your own pace, but all learners proceed through the 11 major sections at essentially the same rate: slowly and straight ahead. Most of the displays permit only forward movement, one display at a time. In tutorials, for example, you page forward, changing displays or adding more text by pressing the Enter key. But there are no backup or browse options, so the merely curious cannot skim, and the experienced user cannot skip ahead.

Reviewing earlier displays is possible but the method is indirect. You can press M to go to the main menu and start the section again, or press R on a question display and return to the beginning of the entire topic. Neither method is convenient; each loses your current place and obliges you to page back to the point of departure. This can be a tedious process, especially if you were well into the section when you lost your place. Moreover, the limits imposed on browsing and reviewing can turn the quizzes into tests of memory, not knowledge.

Where the courseware reaches for depth, it fails because of limitations imposed by the choice of the computer as a medium for content that could have been more effectively presented in print. For example, in explaining the differences between BASIC, Pascal, C, and COBOL, the courseware authors use one model: a program that requests and prints a name. It would be useful to compare each language version side by side, and in a book this would be no problem.

Here, however, the program examples appear on separate displays—in some cases in different sections. Of course, it is not possible to flip back and forth between displays or sections. Consequently, you must remember or record the details. A simple solution would be to put this kind of useful instructional material in the accompanying reference guide, but that text has other uses.

The programmers have limited learner input to the characters comprised by the specific response. For example, if the answer to a question is the word *run*, you can type only the letters R, U, and N, in any order. If you type any other characters, they won't be displayed. Similarly, if a multiple choice question has four possible answers (A, B, C, and D), only those letters can appear on the screen.

> All learners proceed at essentially the same rate: slowly.

In the quizzes, the program evaluates your responses as soon as you type them in. A more benign approach would be to suspend judgment until you confirmed the answer by pressing a second key, allowing you to correct a mistake or revise an answer.

The feedback tends to be musical and enthusiastic. The program rewards correct answers by writing "Super" in bold letters across the screen, accompanied by a few synthesized notes. In some places, however, feedback is unhelpful. I answered a question in Section J, Operating Systems/Programming Languages, with a variety of incorrect responses:

```
Indicate which language you
would choose in each of the
following situations
   A. BASIC      D. COBOL
   B. Pascal     E. C
   C. FORTRAN    F. Assembler
To develop an accounts
receivable system for a small
company.
```

The feedback for answer A was "Sorry. Not a bad choice, but not the one I had in mind. Try again." This is a frustratingly mixed message. Translated, it reads: "Your answer is good, but I won't tell you why. I'm thinking of a better answer. Guess what it is."

Next I chose B and got this response:

"Right. Well, Pascal isn't a bad choice, although COBOL would be good too." I was struck by the almost grudging tone of this "positive" feedback.

The test questions remain unchanged, in difficulty and number, whether your responses are good or poor. In fact, at times the courseware seemed unaware of my performance. For example, I systematically chose the wrong answers to one question. On the third try I chose the correct answer, eliciting this flattering but false feedback: "Well Done. Super. You Must Have Been Paying Attention"—the same message I would have received for a correct response on the first try.

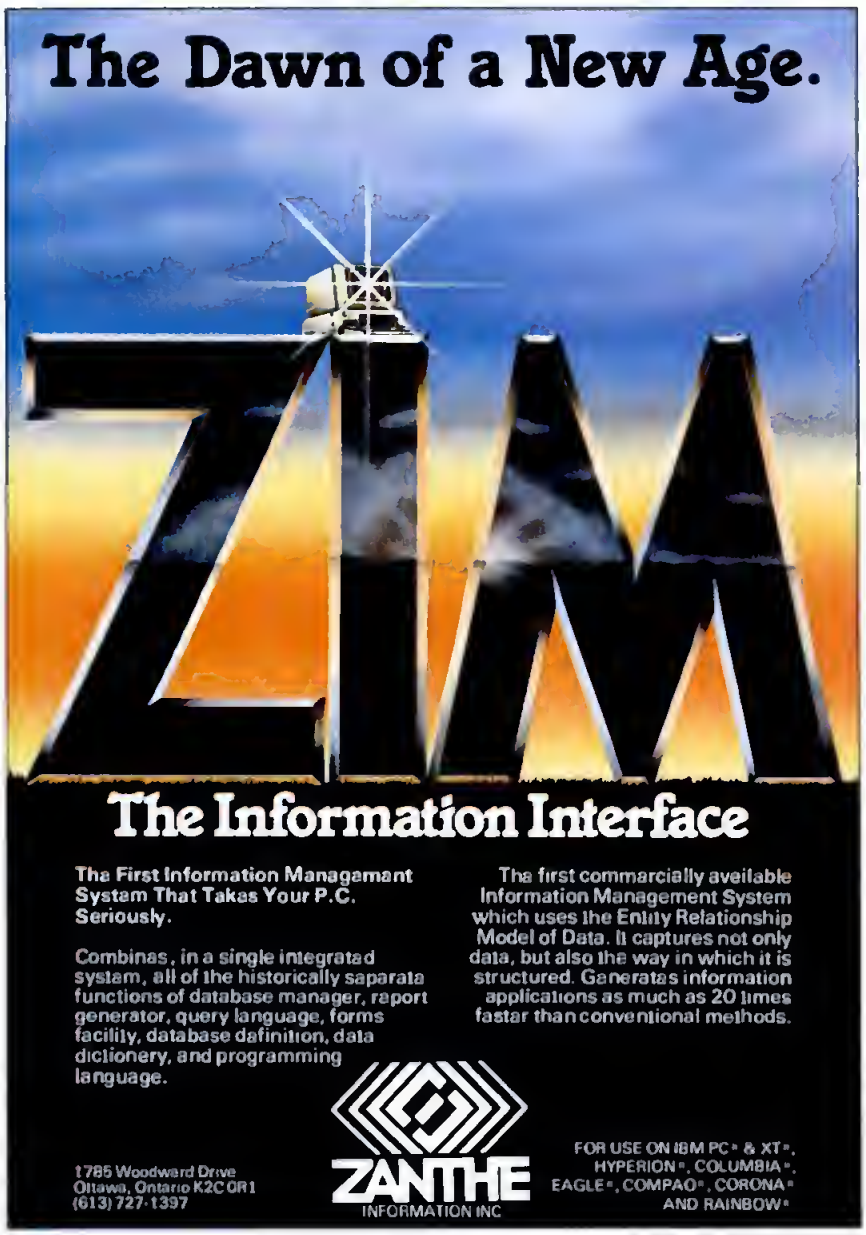
The program does not keep records of quiz scores, so you can't compare your performances between or within sections. If you elect to take the courseware in several sessions, you are responsible for tracking your quiz scores as well as the sections you've completed.

Rereading the Guide

About 65 percent of the information in the reference guide is already in the hands of IBM PC owners, and in more detail. The guide is simply a selective summary of the PC-DOS manual, BASIC manual, and *Guide to Operations*. It has an incomplete list of DOS commands (batch and advanced commands are omitted) and abbreviated descriptions of them.

The last section of the reference manual contains eight exercises to be completed after you finish particular sections on the disks. This material is potentially valuable, since its goal is to guide you in actually using DOS. First, each exercise outlines a procedure (for example, display the directory on drive A: in multiple columns). Then, on a separate page, it describes the steps you would take to perform the procedure. My only criticism of this section is its brevity. More of this approach would enhance the educational worth of this package immensely.

The problem of *How to Use Your IBM Personal Computer with PC DOS* is that it is courseware in the worst sense of the word. It barely exercises the computer's potential as an instructional medium. Interactive courseware, which this program claims to be, should actively engage the learner's attention. This program, however, doesn't require very much—certainly not enough to justify presenting the material on a micro and not in a book. ■



CIRCLE 210 ON READER SERVICE CARD

The PC Remedy For a Hospital's Ills

A health care center's leisurely transition to in-house PCs became a trial by fire. Here's how St. Benedict's made the switch under less than ideal circumstances.

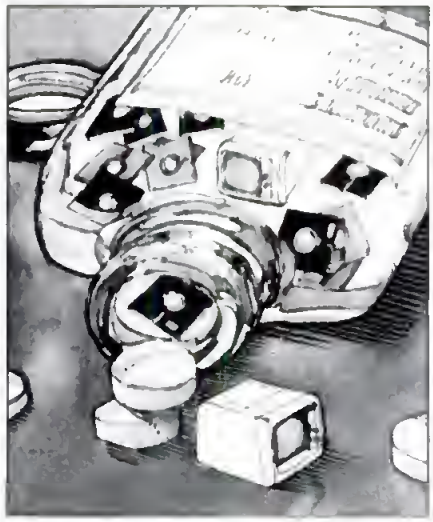
At St. Benedict's health care center in San Antonio, Texas, accounting functions were handled for years by a semi-automated mix of monthly computer reports from a service bureau and manual bookkeeping. Two different computer service bureaus maintained the accounting and payroll files. Financial statements were generated with a desktop calculator.

When the service bureau went bankrupt a year ago and left the center stranded, business manager Dan McKnight's department resembled a hospital accountant's version of St. Elsewhere. Today, the turmoil has largely been brought under control with the help of four PCs linked by a Corvus Omninet. That hardware roster was recently expanded with the addition of an IBM Portable PC.

Budget Battles

McKnight has been going to the mat for the past 4 years with one of the toughest CEOs ever to control a purse string. Each June he must submit a budget outlining the needs, including data processing, of the accounting department at St. Benedict's. The proposed budget circulates among the hospital's Finance Committee before reaching the scrutinizing eye of Sister Mary John, the chief administrator.

Since taking the helm a decade ago, Sister John has guided St. Benedict's from



a hospital and nursing home serving the aged poor to a community-based health care microcosm. The accounting department budget—and in particular computer purchase requisitions—never fares well against her humanitarian concerns.

Despite the diverse factions competing for the tight budget, St. Benedict's administrators finally agreed in 1982 that the accounting system was no longer keeping pace with the health center's growth. After evaluating other alternatives, they approved the purchase of an in-house computer. In-house computing capability had the attraction of flexibility, quality control, and quick turnaround, but the diversity of the accounting procedures presented a dilemma. Where would the software to handle the accounting requirements of the myriad services come from? Off-the-shelf software packages existed for hospitals, nursing homes, and physician's charges, but none of these packages integrated the distinct functional areas. Hiring a team of programmers to write custom software would solve the problem, but the expense would be prohibitive.

The software problem was solved when one member of the Finance Committee casually mentioned the problem to an associate who taught computer science at nearby Trinity University. Why not let Trinity's graduate students write the custom software, the professor suggested. Students, after all, are always looking for practical experience. Trinity would grant course credit for the work, and St. Benedict's could use the finished programs at no cost other than the time involved in dictating the requirements.

Trinity and St. Benedict's reached a deal and resolved the software issue. Next, the Finance Committee concentrated on hardware. After evaluating several computers, including systems from Burroughs and Wang, St. Benedict's invested in the four PCs and a Corvus Omninet with a 20-megabyte hard disk.

The delivery of the PCs was scheduled for early 1983 to correspond with the availability of the custom software. Six

Illustration: Michael Ng

ORDER DESK ONLY — (800) 272-3360 TOLL FREE IN CALIFORNIA

ORDER DESK ONLY — (800) 292-3360 TOLL FREE OUTSIDE CALIF.

"WHY PAY MORE"
COMPARE THESE PRICES

MC-P APPLICATIONS

Brings Software & Hardware At Unbeatable Prices

SOFTWARE

	LIST	OUR
ASHTON TATE		
dBase II	$700	$295
Finencial Planner	700	452
Fnday	295	175
CONTINENTAL		
Home Accountant	150	105
FOX & GELLER Quick Code	295	174
FUNK SOFTWARE Sideways	60	45
HOWARDSOFT		
Real Estate Analyzer II	250	165
HUMAN SOFT DB Plus		89
LIFEBOAT SYSTEMS		
Lattice 'C' Compiler	500	325
LIFETREE Volkswriter Deluxe		175
LIVING VIDEOTEXT		
Think Tenk	195	125
LOTUS — 1-2-3	495	299
MICROPRO Spell Star	250	162
Mail Merge	250	162
Super Sort	250	149
Calc Ster	145	86
Info Star	495	320
Word Ster Pro w/Correctstar	695	369
MICRORIM R Base 4000	495	325
MICROSTUFF Crosstalk	195	109
MICROSOFT		
Multiplan	250	159
Flight Simulator	50	35
Multitool Word W/Mouse	475	295
Pascal Compiler	350	245
C Compiler	500	325
PETER NORTON		
Peter Norton Utility	80	55
PBL CORPORATION		
Personal Investor	145	98
PEACHTREE Peach Peck	595	249
ROSESOFT Prokey		95
SATELLITE Word Perfect	495	325
SOFTWARE DIMENSIONS		
Accounting Plus GL, AR, AP, PR, INV—Each	599	399
SOFTWARE PRODUCT INTERNATIONAL		
Open Access	595	369
SOFTWARE PUBLISHING		
Pfs:File	140	89
Pfs:Report	125	79
SOFTWORD SYSTEMS		
Multimate	495	275
SORCIM SuperCalc II	295	175
SuperCalc III	395	239
Super Writer	295	205
STATE OF THE ART (FM Series)		
GL, AP, AR, INV, PR—Ea.	595	375
VISICORP Visicalc IV	250	175
Visifile	300	195
VisiTrend/Plot	300	195
VisiSchedule	300	195

Monthly Specials

Tandon TM 100-2
$205.00

AST SIX PAK (64K)
$265.00

AMDEK 310A
$169.00

MULTIMATE
$275.00

IRMA 3270
$1045.00

OPEN ACCESS
$369.00

Value Paks

LOTUS 1-2-3
$299.00

PLANTRONIC + PRINCETON GRAPHIC
$869.00

R:BASE 4000 + MULTITOOL WORD W/MOUSE
$585.00

LOTUS 1-2-3 + HERCULES CARD
$669.00

ORDER STATUS & TECHNICAL SUPPORT — CALL (408) 293-3360

Call for Hardware & Software Prices Not Listed This Ad

Used PC's & Apples Bought & Sold

HARDWARE

	LIST	OUR
HAYES MICROCOMPUTER PRODUCTS		
Stack Smart Mod 300	$289	$199
Smert Mod 1200 B (IBM)	599	429
Smart Mod 1200	699	495
MOUSE SYSTEMS		
P.C. Mouse w/Software	295	219
NOVATION		
J-Cat	149	105
Smart-Cat 103/212	595	445
Smert-Cet 103	249	187
KRAFT & TG JOYSTICKS	70	35
ELECTRONIC PROTECTION DEVICES		
Orange	140	94
Peech	98	64
IBM PC 64K/2 Drives/ Controller Cd.		2169
IBM XT		4295
AST RESEARCH		
Megaplus 64K	395	265
Six Pac Plus 64K	395	265
QUADRAM		
Quadboard II 64K	395	275
Quedcolor I	295	219
Quad 512 + 64K	325	245
Quadlink	680	525
STB COLOR GRAPHIX CARD		375
TANDON		
TM 100-2 Drive	395	205
TALL GRASS		
Hard Disc & Tape, 12 Mgb	3495	2995
TEAC HALF HEIGHT		199
PEGASUS		
Hard Disk 10 Mgb (internel)		1195
PRINTERS		
Epson FX 100		725
IBM Perallel Printer Cable	50	37
NEC 7730 RO Parallel	2595	2295
Okidata 92	699	459
Qume 1140 plus	1685	1525
MONITORS		
Amdek MAI Board	599	459
Amdek 12" 310A	230	169
Amdek Color II RGB Hi-Res	529	399
Hercules Grephics Card	499	359
Princeton RGB Hi-Res	795	485
Plantronics Color Cerd	595	385
USI PI3	249	149

International Dealer Inquiries Welcomed

CIRCLE 290 ON READER SERVICE CARD

MC-P APPLICATIONS, Inc.
1630 Oakland Road, Suite A-114
San Jose, CA 95131, USA Phone (408) 293-3360
Telex: 821396 MCPA UD
HOURS: 8:30 a.m. to 5:30 p.m. — Mon. - Sat.
Call for Prices in Australia at 02-929-8468

TERMS: All prices subject to change. Cashier's check/MO/Bank Transfer. Allow time for company or personal checks to clear. Prices reflect cash prepaid discount. VISA/MASTER CARD/COD/PO's +3%. California residents add sales tax.
SHIPPING: $4 per item for UPS surface ($8 for Blue Label); Monitors $20, Printers $25, within continental USA.

computer science students spent the fall semester of 1982 laying out a detailed plan for automating the accounting procedures. They would begin programming in the next semester and planned to complete the first major component that spring. As the programs were brought on-line, McKnight planned to run them in parallel with the existing system for 3 months in order to audit the output of the PCs while maintaining the existing records in case of snags.

The Setup

When the equipment arrived, three of the PCs were set up in the accounting and financial departments. One PC equipped with *1-2-3*, *WordStar*, and a NEC letter quality printer was placed in the office of the chief financial officer for budget reporting. Two others were configured with dot matrix printers and assigned to the accounting department where six employees would alternately post patient charges. The remaining machine was reserved for programming and testing new applications.

With the hardware installed and the software advancing on schedule, McKnight hoped that the conversion to the PCs would be nearly complete within 6 months.

The well-thought-out plan for parallel operations never came to fruition, however. One day soon after the PCs were delivered, a van-load of computer listings appeared at St. Benedict's receiving dock. The service bureau that processed accounts receivables and payables had gone bankrupt. "They gave us our last 30 days work in a box and walked away," McKnight recalls.

The demise of the service bureau transformed the unhurried conversion into a full-speed-ahead effort to bring programs on-line. St. Benedict's hired a programmer to expedite the software development process. McKnight, meanwhile, put the accounting department on overtime to generate bills manually until the software could be pieced together.

The programmer worked closely with the Trinity students in testing and installing applications written in Microsoft COBOL. First to come on-line was the patient charging and billing system.

Besides generating revenue through timely billing, the patient-charging system immediately cut time and expense in several areas, most notably the Medicare gateway program. This program connects the PC via a modem to mainframe computers in Dallas maintained by EDS, Inc.,

▶ Pascal and C Programmers

▶ Blaise Computing's productivity tools allow Pascal and C programmers to develop reliable software taking full advantage of the capabilities of the IBM PC and XT. Support for Microsoft and IBM Pascal, Microsoft (Lattice) C and CI-C86 is provided.

▼

TOOLS — All Source Code is included

Total string capability, complete screen access, keyboard handling, a graphics interface, access to all BIOS functions, and much more are provided in over 40 routines.

▼

TOOLS 2 — All Source Code is included

A general DOS gate allows you to access any DOS 2.0 function from Pascal or C. Program execution and DOS internal command execution are supported as high level calls.

▼

VIEW MANAGER — Source Code available

VIEW MANAGER is a screen support system of a mainframe for the IBM PC/XT. Screens are constructed with a true Screen Painter supporting any attribute or color and the screens are stored efficiently in a Screen Database. VIEW/LIBRARY supports access to screens and true block mode data capture and display from application programs.

TOOLS	125.00
TOOLS 2	100.00
VIEW MANAGER	275.00
VIEW MANAGER (with Library Source)	425.00
MS-Pascal Compiler	275.00
Microsoft C Compiler	450.00

BLAISE COMPUTING INC.

2034 Blake St. Berkeley, CA 94704 415/540-5441

CIRCLE 150 ON READER SERVICE CARD

IS YOUR HEALTH WORTH $145.00

. . . Don't Take Your Most Precious Asset, Your Health, for Granted . .

Positive LIFESTYLING™

Helps You Take Charge Of Your World

COMPREHENSIVE
- Covers the key aspects of well being:
  - ★ Exercise ★ Nutrition
  - ★ Stress Management
  - ★ Chemical Dependency Control
- Sets goals for eleven factors including weight control.
- Tracks an entire family's progress for up to four years.

PERSONALIZED
- Provides an interesting & motivating review of your lifestyle.
- Gives clear, immediate feedback.
- Provides unique, personalized recommendations that guide you towards healthy patterns of living.

EFFECTIVE
- Promotes well being by building awareness and self esteem.
- Presents data in a clear manner without being simplistic.

RELEVANT
- Positive Lifestyling uses concepts developed from extensive research by health experts.

EXCITING
- Positive Lifestyling features a full range of exciting graphics and color.
- Positive Lifestyling makes improved well being fun, not a chore.

EASY TO UNDERSTAND
- Positive Lifestyling can be operated easily by computer novices.
- The unique tracking system is stimulating and easy to follow.

ACT NOW
- Send $7 for a demo, or $145 for the Positive Lifestyling Program. Add $5 for shipping & handling.
- Positive Lifestyling is designed for the IBM PC and compatibles.
- Mastercard & Visa welcome.
- Contact: Softworld Inc., 9550 Black Mountain Road, Suite G, San Diego, CA 92126, (619) 578-4878.

Positive LIFESTYLING™

CIRCLE 153 ON READER SERVICE CARD

to process Medicare claims. An IBM 3270 adapter card in the PC handles the communications protocol.

After the 3270 link and other billing programs were up and running, the programming team turned its attention to the patient payments system. While McKnight was waiting for this part of the system to be developed, he learned *1-2-3* in order to process financial reports. "That program is worth ten times its price," he lauds.

Consider These Caveats

In other applications areas, McKnight purchased canned software as "survival tools" to tide the conversion over until the accounting department is ready to write its own programs. IBM's general ledger and accounts payable packages temporarily handle a major part of the workload. Nonetheless, McKnight has less than kind words for this package, which had several problems in Version 1.0. "We learned about them through long, hard experience," he says. "Be sure to get Version 1.1 if you buy it."

McKnight has other caveats for health care administrators considering a PC approach to hospital accounting. "Be prepared for hardware failures," he says, tapping a PC cabinet. "We've replaced virtually every disk drive. This gets to be expensive, especially after the warranties expire."

Purchasing supplies proved to be another unanticipated expense. "As soon as you add the word *computer*, the cost doubles," McKnight laments. "This includes paper, printer ribbons, and even ordinary tables. Shop around for the best prices. For example, we cut diskette expenses by 40 percent by purchasing through a discount vendor."

The high cost of repairs and supplies is partially balanced by savings in the purchase of a hard disk backup system. The entire 20 megabytes of the Corvus hard disk can be copied using an off-the-shelf videocassette recorder at a fraction of the expense of magnetic tape drives designed for computers.

Over the past year, St. Benedict's accountants have received a virtual baptism by fire on operating PCs. What started as a leisurely conversion turned into a red-alert. McKnight originally thought that programming skills and hardware knowledge would be the main factors determining the success or failure of the computer endeavor. Looking back, he says, "Our management abilities were the most important factor all along." ■

telesoft CALL TOLL FREE 1-800 IBM ONLY

Order Line: 1-800-426-6659 Order Processing & Other Information: 602-224-9345 Order Line Hours: Mon-Fri 8:30 - 5:30 Saturday 9-1
Address: 1943 East Indian School Road Suite 194 Phoenix, Arizona 85016

Prices reflect a 3% to 5% cash discount. Shipping $3.00 per order
Send cashier's check or money order. All other checks will delay shipping two weeks.
Prices & availability subject to change without notice

SOFTWARE SPECIALS

d BASE II	$289	TOBIAS' MANAGING YOUR MONEY	$119
UPGRADE TO d BASE III	$145	VOLKSWRITER DELUXE	$165
SYMPHONY	$475	WORD PERFECT	$249
UPGRADE TO SYMPHONY	$145	THE WORD W/MOUSE	$285

WORD PROCESSORS

Broderbund	
Bank Street Writer	$ 48
Micropro	
Wordstar w/Tutor	330
Wordstar Pro Pack	340
Wordstar Pro Option	169
Microsoft	
The Word	229
Satellite Software	
Personal Word Perfect	115
Software Publishing	
PFS: Write	81
PFS: Proof	58
Sofword Systems	
Multimate	359

INTEGRATIVE SOFTWARE

Ashton-Tate	
Framework	Call
SPI	
Open Access	$339

SPREADSHEETS

Lotus	
Lotus 1-2-3	$399
Microsoft	
Multiplan	124
Software Publishing	
PFS: Graph	81
PFS: Report	71
Sorcim	
Supercalc 2	149
Supercalc 3	210
Visicorp	
VisiCalc IV	65

COMMUNICATIONS

Microstuf	
Crosstalk XVI	$105
Software Publishing	
PFS: Access	59
Wolf Software	
Move It	89

UTILITIES

Funk Software	
Sideways	$ 39
Peter Norton Utilities	
Norton Utilities 2.1	52
Rosesoft	
Prokey 3.0	79

TRAINING

American Training Institute	
ATI for IBM	$ 49 ea.
Cdex	
Cdex for IBM	43 ea.
Davidson & Assoc.	
Speed Reader II	65
Lightening	
Mastertype	30
Microsoft	
Flight Simulator	35
Simon & Schuster	
Typing Tutor III	30

DATA BASE MANAGEMENT

Alpha Software	
d Base Manager II	$165
Applied Software Technology	
Versaform (PC & XT)	335
Ashton-Tate	
d Base III	Call
Friday!	169
Condor Software	
Condor III	325
Harvard Software	
Harvard Project Mgr	239
Living Videotext	
Think Tank	119
Main Street Software	
Main Street Filer	179
Micro DB Systems	
Knowledgeman	275
Microrim	
R Base 4000	275
Clout	130
Software Publishing	
PFS: File	81
Stoneware	
Advanced DB Master	347

MONEY MANAGEMENT

Continental	
Home Acct Plus	$ 85
Mongram	
Dollars & Sense	96

SOFTWARE ADVISOR'S TELESOFT NOW ON CompuServe & NewsNet 87

QUICK!

What portable computer has multi-color capability, weighs less than 35 pounds, has more memory, is IBM compatible and costs less?

If you didn't answer the ISM Express, then you don't know about the one portable computer that has it all. Available in a floppy disk or 10 megabyte hard disk version, the ISM Express is more powerful and flexible than its competitors. It will display all your graphics in 4 or 16 colors, as well as provide you with a text resolution comparable to a true monochrome display. And that's not all. This go-any-where computer is also more economical. For more information on the ISM Express and your nearest dealer, call 301-279-5775.

ISM **Wherever you go, take the ISM Express.**

CIRCLE 239 ON READER SERVICE CARD

The Right Commands At Your Fingertips

KLEERTEX

...For Your IBM®-PC/XT!

Only
$19.95

$32.95 FOR 2 ON 1
DOUBLE SIDED TEMPLATES
WITH A 15-DAY MONEY BACK
GUARANTEE

Designed by Training Specialists to help put your program to work, right away!

- Complete commands required to learn and operate your program
- Alphabetized commands to find what you need quickly and easily.
- Organized with key-by-key examples for simplicity

This Time Saving Aid is Ideal for Training, Invaluable for Beginners, and a welcome convenience for the Comprehensive User. Made of sturdy, non-scratchable, non-glare, color matching plastic.

The right commands... ...the right price!

KLEERTEX
Keyboard
Templates
Now Available

▲ $ 8.95
● $19.95
○ $32.95

	WORDSTAR / MAILMERGE	dBase II	MULTIPLAN	SUPERCALC	SUPERCALC II	EASYWRITER II	APPLEWRITER II	QUICK FILE	PFS WRITER	APPLEWRITER II / QUICK FILE	APPLEWRITER II / VISICALC	PERFECT WRITER	PERFECT CALC	MULTIMATE	PERSONAL PEARL	DO IT YOURSELF PLANNER	1-2-3	VISICALC
IBM® STYLE A*	●	○	●	●	●	●			●			●	●	●		▲	○	●
IBM® STYLE B**	●	○	●	●	●	●			●			●	●	●		▲	○	●
KAYPRO®	●	●										●	●			▲		
APPLE® II+	●	○					●				○					▲		●
APPLE® //e	●	○	●				●	●	●	○	○					▲		●
OSBORNE®	●	●			●										●			

*IBM STYLE A Fits IBM-PC/XT COMPAQ and LEADING EDGE
**IBM STYLE B Fits COLUMBIA OLIVETTI CORONA TAVA IVY PRONTO, SILICON VALLEY MICRO NORTH STAR DIMENSION LOGICAL L-XT IMP and SPERRY-PC

Call Toll Free
1-800-231-5413

California 1-800-523-5441

DEALER INQUIRIES INVITED

CREATIVE COMPUTER PRODUCTS™

Or Send Order To:
P.O. Box 85152-MB 134
San Diego, CA 92138

We accept VISA, MC, AMEX or checks.
$1.95 Shipping Fee.

Apple/Quickfile-Apple Computer Inc IBM-International Business Machines Osborne-Osborne Computer Corp Kaypro-Non Linear Systems Wordstar/Mailmerge MicroPro International Visicalc-Visicorp Supercalc-Sorcim Easywriter II-Information Unlimited Software dBase II-Ashton-Tate Multiplan Microsoft 1-2-3-Lotus Development Corp Perfect Writer/Perfect Filer/Perfect Calc-Perfect Software Personal Pearl-Peerlsoft PieWriter-Heyden Software Co Compaq-Compeq Computer Corp • CREATIVE COMPUTER PRODUCTS 1983.

CIRCLE 202 ON READER SERVICE CARD

Micro Insurance

How and for how much should you insure the computers that you and your company depend on? Insurance firms provide a variety of ways to keep your micro covered.

Insurance for personal computers is a much-ignored and little-understood offshoot of the recent technological boom. Yet both homebound micros and office desktop systems require some form of coverage. Newly created policies, designed primarily for businesses, are now adjusting coverage to include these traditionally excluded dangers.

For individuals who use their PCs for purely personal purposes, the options are relatively straightforward. Most insurance companies offer special riders to existing homeowner's policies, designed to cover the additional expense of the computer itself. Some policies provide a "replacement cost" endorsement instead of an "actual cash settlement" that would deduct for depreciation.

Numerous Exclusions

A floater policy can be written to include a broader range of perils, but most riders still cover only those mishaps that could be incurred by any household article. Such mishaps include fire, theft, vandalism, riot or civil commotions, collapse of building, falling objects, airplane crashes, and burst pipes. Exclusions are even more numerous, including loss of income, programming errors, mechanical breakdowns, electrical hazards (except lightning or those that result from fire), wear and tear, and vermin.

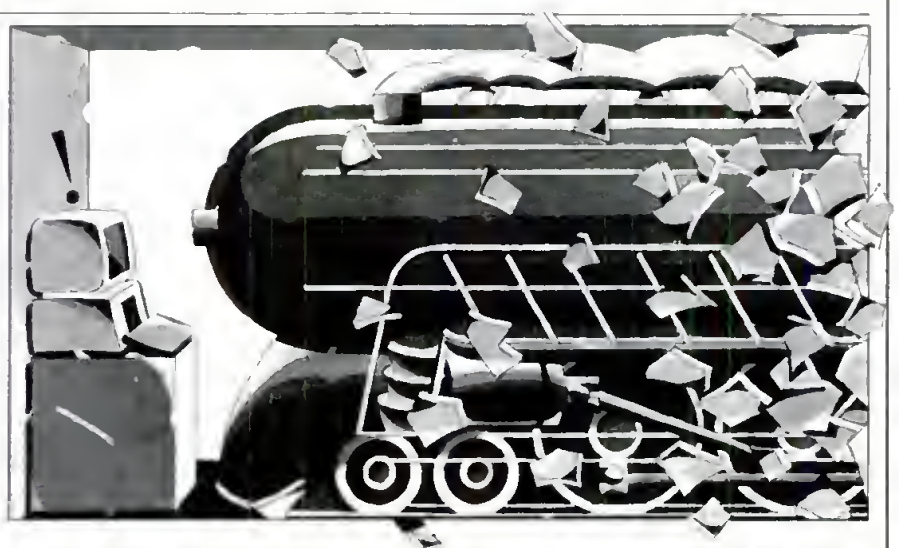


Illustration: Phil Anderson

A typical computer endorsement like this will run about $36 per year for extended coverage of $7,500. However, if you use your PC for any business at all, a minicomputer policy (which includes micros) may be worthwhile. The Travelers Insurance Company offers all-risk coverage that excludes only the damage of wear and tear for $5,000 on a minimum premium of $250. Nationwide and Liberty Mutual provide policies with smaller premiums but longer lists of exclusions.

These forms of coverage apply only to hardware. Software, in insurance parlance, is divided into "data" and "media." Data refers to all programs and electronically-converted information stored on magnetic tapes, disks, drums, or cards; media are the physical materials on which the data are recorded. Occasionally a policy will cover the cash value of the media, but the data, by far the more expensive component, is usually excluded.

However, some companies, such as Safeco, have introduced special home computer policies that cover both hardware and software. Its policies include damage to the equipment anywhere in the world, which is important for portable PC owners. Exclusions are few, primarily covering electrical and magnetic disturbances and programming errors.

The Kemper Group, in its Personal Electronic Equipment endorsement, offers

Now...Supercharged communications software for your high powered 16 bit PC.

The makers of CROSSTALK proudly announce the newest entry into our line of high performance communications software. CROSSTALK XVI — a communicatians pragram with the speed and features of a fine racing machine. Shift from status display ta incaming cammunicatians and back again at full throttle. Drive smoothly through the program with CROSSTALK XVI's integrated help system. Enjoy the full use of functian keys. CROSSTALK XVI can be used with mast autadial madems, and emulates several af the most used terminals. Test drive CROSSTALK XVI taday at yaur lacal dealer.

CROSSTALK™ XVI

MICROSTUF

1845 The Exchange / Suite 140 / Atlanta, Georgia 30339 / (404) 952-0267

Dealer orders call toll-free (800) 241-6393

CROSSTALK XVI is a trademark of Microstuf, Inc.

CIRCLE 321 ON READER SERVICE CARD

$15,000 all-risk repair or replacement coverage for exposures normally excluded by standard policies.

Kemper insures for all causes of direct physical loss to the property except wear and tear, insects or vermin, war (including insurrection, rebellion, or revolution), and nuclear hazard.

Maryland Casualty recently issued a smart home computer endorsement to its homeowner's policies. Written with a $50 deductible and a separate liability limit over the personal property ceiling, this rider covers nearly all perils for hardware, software, peripherals, and add-ons.

The Insurance Business

For businesses there is a rapidly expanding variety of insurance options. Some firms simply include their computers under standard property policies. The preferred methods of special treatment include an all-risk Electronic Data Processing (EDP) policy or a Difference-in-Conditions (DIC) policy with an EDP form attached.

Many DIC policies are shot through with exclusions in vulnerable areas, such as damage due to environmental features, dust, and rust. These perils should be covered. Some policies insure against losses caused by mechanical failure and electrical disturbances but are only written with a deductible of as much as $10,000.

Where software is concerned, there is usually a strict limit on the insured value of media materials, and this is only for their cost in unexposed form before programs or data are added. To reconstruct the lost data, companies can generally recover no more than $1,000 per occurrence. Whatever software coverage is provided cannot be used as a substitute for Valuable Papers insurance, which you need to cover any supporting documents. EDP policies only cover data in "usable" form, not unconverted source material.

Extra expenses related to data processing failure, such as equipment rental and necessary time-sharing facilities, should be anticipated and covered. So should business interruption losses. These conditions may be most significant when they involve computerized production equipment. As an exception, Kemper has broadened its Boiler & Machinery Policy to include computers that control mechanical or electrical equipment.

Kemper also boasts perhaps the most comprehensive computer coverage with its Business Electronic Equipment Policy (BEEP). Most standard exclusions—even faulty construction and error in design—have been removed in this $250,000 all-risk policy.

Electronic thievery is a serious threat for many institutions. Both the Insurance Services Office and the Surety Association of America have issued Computer Fraud endorsements to their Blanket Crime policies. Lloyd's of London, Aetna Life & Casualty, Shand, Morahan & Co., and St. Paul Fire & Marine have created various Electronic and Computer Theft forms either to supplement or act as riders to existing Blanket Bonds.

Risk Management

Risk management may be the most crucial element in computer insurance. Many common dangers can be avoided through prudent planning and precautionary measures. Something as simple as a surge protector (the Lloyd's-underwritten line of products offered by Electronic Protection Devices, Inc., of Waltham, Massachusetts, includes one) can eliminate the fear of spikes or glitches. Alarms and security techniques should also be implemented.

Other loss prevention methods include installation of halon fire extinguishers, off-premises storage of duplicate media, and contingencies for emergency use of substitute data processing facilities (hot-sites, which are fully stocked working data centers shared by many companies, are suitable backups).

Only by creating a comprehensive risk management and disaster recovery plan can a company determine its loss potential or true risk and develop an appropriate insurance program. ■

MENU FOR YOUR EPSON

Now you can have full menu-based operation of all control functions of all of the Epson MX, FX and RX printers. **Printer Boss**™ software lets you send all of the complicated control codes, in seconds, by making menu selections with a few simple keystrokes.

Select and deselect pica, elite, compressed, italic, enlarged, emphasized, doublestrike, underline, superscript and subscript for scores of different type faces. **Set** line spacing, right and left margins and skip-over-perforation. **Load** USA, France, Germany, England, Denmark, Sweden, Italy, Spain and Japan language sets **Control** unidirectional, half-speed and proportionally-spaced printing. **Store and retrieve** 10 complete menu settings with a few keystrokes. Create ASCII files of data, corresponding to the stored menu settings, which can be accessed by or included in your own programs to set up the printer as required. **Emulate** the IBM-label printer for the IBM-PC, eliminating printout problems with IBM-PC software and Epson FX printers. **Download** to FX printers five different **IBM character sets,** including graphics, screen and APL characters and greek symbols. Print two-pass **letter quality** on your FX at **full text-mode speed,** up to 10 times faster than with programs using graphics mode. Print multi-page **spreadsheets** as wide as you like, **sideways** on your paper, in a choice of five different type sizes. Or create a **printer buffer** of up to 32K. Ideal for **IBM graphics** software, or **screen dumps,** or printing text from **Wordstar, Lotus 123** or many other fine programs.

Printer Boss™ for the IBM-PC and compatibles $59.95. With Letter Boss™ letter quality or Sidekick™ sideways print option $99.95. With both $139.95. Visa, MC, or send check. Free info. Dealers welcome.

Printer Boss™

CONNECTICUT SOFTWARE
30 WILSON AVENUE
ROWAYTON CT 06853
203-838-1844

SIDEKICK IS NOT TO BE CONFUSED WITH SIDEWAYS A TRADEMARK OF FUNK SOFTWARE PRINTER BOSS LETTER BOSS AND SIDEKICK ARE TRADEMARKS OF SPEER RESEARCH CORPORATION WORDSTAR AND LOTUS 123 ARE TRADEMARKS OF MICROPRO INT L CORP AND LOTUS DEVELOPMENT CORP RESPECTIVELY

CIRCLE 317 ON READER SERVICE CARD

PALANTIR™ WORD PROCESSING

WE DON'T HAVE TO BEEF UP OUR GUARANTEE WITH A LOT OF BULL

Other software companies give you disclaimers. Palantir gives you a real guarantee: Palantir backs its software with 90 days of free phone support via a toll-free number. When you call, we won't tell you to ask your dealer or read your manual; we'll answer your question, free of charge. If we can't solve your problem, we'll replace your Palantir Software with any competitive software of comparable value.

We couldn't make an offer like this if we weren't confident about Palantir word processing. It's easy to learn, easy to use, easy to live with.

Palantir word-processing software is designed for microcomputers. Yet it gives you all the features of a dedicated word processor. You won't find a better system on the market today.

To find out more about Palantir software, mark the reader-service card in this issue or call, toll-free: 1-800-368-3797. In Texas, call 713-520-8221.

We'll respond with detailed information on Palantir software and a free "No Bull" button. A closer look will convince you that we're not just one of the herd. And that's no *bull*.

Palantir Software 3400 Montrose Blvd. Suite 718 Houston, Texas 77006

™ Palantir is a trademark of Palantir, Inc.

CIRCLE 527 ON READER SERVICE CARD

New On The Market

HARDWARE

BUSSter A64R Digital Input Module

A 64-line digital input device that interfaces to the user's system via a standard RS-232 serial port. The device accepts commands from the host computer through its serial port, reads and stores data from up to 64 digital TTL level lines, and then sends this information back to the user's system as called for by the application.

The BUSSter A64R Digital Input Module can be programmed with BASIC commands. The unit's built-in timer and data buffer allow data sampling and collection to occur as a background operation, while the user's system is occupied with other tasks.

(List Price: $495)

Connecticut microComputer Inc.
36 Del Mar Dr.
Brookfield, CT 06804
(203) 775-4595
TWX: 710-456-0052

CIRCLE 786 ON READER SERVICE CARD

BUSSter A64R Digital Input Module, *Connecticut microComputer Inc.*

PLAN 2000

A network system consisting of interface cards and software capable of linking up to 255 PCs and devices. The system links clusters of two to four PCs and/or peripherals to a file server—a host PC that can continue to operate independent applications at the same time network functions are processed. Network software allows for printer and disk sharing and offers features such as guaranteed exclusive access to personal work volumes, read-only access to program libraries or information owned by other users, locks to implement multi-user applications, and passwords to protect private information.

PLAN 2000, *Nestar Systems Inc.*

The PLAN 2000 system utilizes the Datapoint Corporation's ARCnet token-passing protocol, which can transfer data at rates up to 2.5 megabits per second up to a maximum distance of 22,000 feet between PCs.

(List Price: Two-system kit, $1,995)
Nestar Systems Inc.
2585 E. Bayshore Rd.
Palo Alto, CA 94303
(415) 493-2223

CIRCLE 787 ON READER SERVICE CARD

Group Response System

A hardware/software system that can link up to 60 participants to an IBM PC using individual keypads to input participant responses. The keypads have 12 keys—the numbers 0 through 9, and the words "yes" and "no." This permits responses to questions with a range evaluation, such as "on a scale from 1 to 10," as well as true/false, yes/no responses.

The included software for the Group Response System allows the host IBM PC to immediately tabulate the group responses, producing a color bar chart on the color monitor. Hard copies of individual results can also be made.

Also included with the package are BASIC programs designed to aid instructors who lack computer programming skills to retrieve and analyze response results. Diagnostic software is included to confirm whether the system is installed properly. *(continued)*

The starter Group Response System package includes all programs and manual, as well as 15 Response keypads.
(List Price: Starter kit, $1,800; additional keypads $65)
Reactive Systems, Inc.
40 N. Van Brunt St.
Englewood, NJ 07631
(201) 568-0481

CIRCLE 781 ON READER SERVICE CARD

DP-9725B Color Printer

A color dot matrix printer with software that permits high-resolution dumps of graphics and text displayed on the IBM graphics monitor. The DP-9725B Color/Scribe Printer employs a multiple-pass capability and a four-color ribbon with yellow, magenta, cyan, and black bands. A single color can be selected for each pass of the printer and multiple color combinations are obtained by overlaying single color selections under software control. The printer can change colors at any point in a printed line.

Four printing modes are available with the printer: enhanced, correspondence, data processing, and graphics. These modes employ either single- or multiple-pass printing, permitting various quality/speed combinations as well as variable colors within a single document. Also standard with the unit are seven character sets, including Swedish, Danish-Norwegian, German, French, Spanish, Italian, and standard American ASCII.

Special features of the DP-9725B Color/Scribe include reverse line feed, speeding color printing of graphics; and automatic control of color selection sequences, which selects overlays from a light to a dark color to prevent color contamination of the ribbon. Internal control codes automatically control color mixing, eliminating the need for the user to program separate overlay control codes to achieve the desired colors.
(List Price: $1,625)
Anadex, Inc.
1001 Flynn Rd.
Camarillo, CA 93010
(800) 4-ANADEX
(805) 987-9660

CIRCLE 785 ON READER SERVICE CARD

***DP-9725B Color Printer**, Anadex, Inc.*

***WX 4731 Plotwriter**, Western Graphtec, Inc.*

LITE-PEN

A lightpen capable of functioning on both IBM's monochrome and color monitors. LITE-PEN has a push-tip actuating mechanism at its tapered end. To begin, the user touches the screen with the pen, activating software included with the device. It self-compensates for screen intensities, maintaining a one-dot resolution on the screen.

LITE-PEN includes a four-conductor I/O cable that connects the device to the IBM lightpen interface.
(List Price: $295)
Requires: Joystick adapter.
The Lite-Pen Co., Inc.
207 S. Hindry St.
P.O. Box 45255
Los Angeles, CA 90045
(800) 634-1967
(800) 821-7807 in Calif.

CIRCLE 782 ON READER SERVICE CARD

WX 4731 Plotwriter

A four-pen drum plotter capable of creating drawings at speeds up to 8 inches per second (200mm/sec), with pen selection under software control. The device can accept paper in standard 8½ × 11 or 11 × 17 inches in size. Features include soft-touch controls on the front panel.
Western Graphtec, Inc.
12 Chrysler St.
Irvine, CA 92714
(800) 854-8385
(714) 770-6010

CIRCLE 784 ON READER SERVICE CARD

SOFTWARE

PCI Cross Assembler

A cross assembler program for the NS16000 32-bit microprocessor. Written in C, the software permits the IBM PC to develop applications programs for systems incorporating the NS16000.

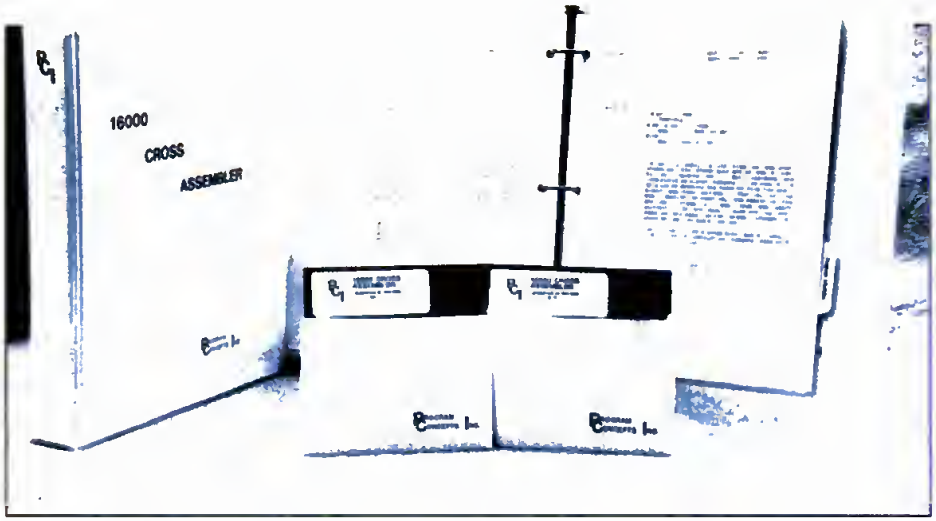
PCI Cross Assembler consists of four utilities: Cross Assembler, Cross Link, Debugger, and Librarian. Features of the software include full macro capabilities as well as floating point and memory management support.

(List Price: $595)

Requires: 192K RAM, two 360K drives, PC-DOS 2.0.

Program Concepts, Inc.
P.O. Box 8164
Charlottesville, VA 22901
(804) 978-1850

CIRCLE 753 ON READER SERVICE CARD



PCI Cross Assembler, *Program Concepts, Inc.*

HFTOOLS for the BASIC User

A machine language module providing BASIC programmers with an integrated set of 22 functions. The functions can be accessed by the user's BASIC program through a CALL command. *HFTOOLS'* functions include printing of the screen, scrolling or clearing windows, determining system configuration, creating specialized character sets, placing an active real time clock anywhere on the screen, using wild cards to access files, and turning BASIC's "write verify" function on or off.

(List Price: $100)

Requires: 4K RAM, one disk drive, PC-DOS, BASIC or BASICA.

H-F Computing Services, Inc.
224 Old Orchard Grove
Toronto, Ontario
Canada M5M 2E5
(416) 482-8195

CIRCLE 752 ON READER SERVICE CARD

DCROSS

A debugging tool and programming aid for programmers creating *dBASE II* command files. *DCROSS* checks command file structures, produces command listings, and can print cross-references of memory variables, data fields, and *dBASE II* commands used in a file.

DCROSS is written in Pascal, and versions are available for both PC-DOS and CP/M-86.

(List Price: $39)

Requires: 128K RAM, two disk drives, PC-DOS, *dBASE II.*

Radox 2 Software
P.O. Box 1230
Loomis, CA 95650

CIRCLE 751 ON READER SERVICE CARD

THOTH

A database management program containing three directories that allow the user to keep track of large numbers of projects, deadlines, meetings, and other managerial responsibilities. The software's Action List component can list hundreds of projects, meetings, birthdays, important events, and so forth by date and priority. Its menu-driven retrieval system can recall data up to 825 characters per item.

The Note Book component provides a directory of data on projects or personnel by category or subcategory. The user can create text files of up to 825 characters per item. The third component, a People Directory, can be used as an automated card file to keep track of important names and addresses, along with up to 25 characters of text for each individual. The software permits up to 12 entries in the People Directory to be linked to an Action List or Note Book item.

(List Price: $99.95)

Requires: 128K RAM, one disk drive, PC-DOS, color/graphics adapter.

Xor Corp.
5421 Opportunity Ct.
Minnetonka, MN 55343
(612) 938-0005

CIRCLE 750 ON READER SERVICE CARD

Introduction to 1-2-3, Learn-PC Video Systems

Format 1-2-3

A utility permitting the user to create Lotus' *1-2-3* spreadsheets from ASCII files and reports. In addition, the program can interface with SAS and SPSS output from a mainframe system, allowing mainframe data to be load directly into the spreadsheet software.

The program can be used with communications software such as *PC-TALK*.

(List Price: $100)

Requires: 64K, one disk drive, PC-DOS.

Reliable Software
P.O. Box 849
Marina, CA 93933

CIRCLE 738 ON READER SERVICE CARD

Introduction to 1-2-3

A videotape-based tutorial with software support for learning Lotus' *1-2-3* spreadsheet/graphics program. Participants first watch a *1-2-3* procedure demonstrated on the videotape. The videotaped lessons show exactly what keys to press and how the computer screens should respond. Then, using the accompanying tutorial diskette and guidebook, the user completes the same procedure on the computer.

Additional diskettes and workbooks are available, allowing the tutorial to be used in classroom applications.

(List Price: $495; additional workbooks and disks, $15)

Requires: Lotus' *1-2-3*.

Learn-PC Video Systems
3601 Woodale Ave. S.
Minneapolis, MN 55416
(800) 532-7672
(612) 546-6049

CIRCLE 756 ON READER SERVICE CARD

Word-Jr

A word processing program for the IBM PC*jr*, consisting of two modules: a full-screen editor and a text processor, *Word-Jr* can support either color or monochrome monitors, and offers a built-in file merge capability.

The software's editor makes use of function keys, and creates true ASCII files. Features include wordwrap, the ability to make global changes within documents, as well as the ability to copy parts of files and move blocks to new locations within a file. The text processing component permits selective printing of form letters from multiple text files, and text formatting commands permitting underlining, bold face, and simulated super- and subscripts.

(List Price: $59)

Requires: IBM PC*jr*: 128K RAM, one disk drive, PC-DOS.

Micro Architect Inc.
6 Great Pines Ave.
Burlington, MA 01803
(617) 273-5658

CIRCLE 755 ON READER SERVICE CARD

Exam Builder

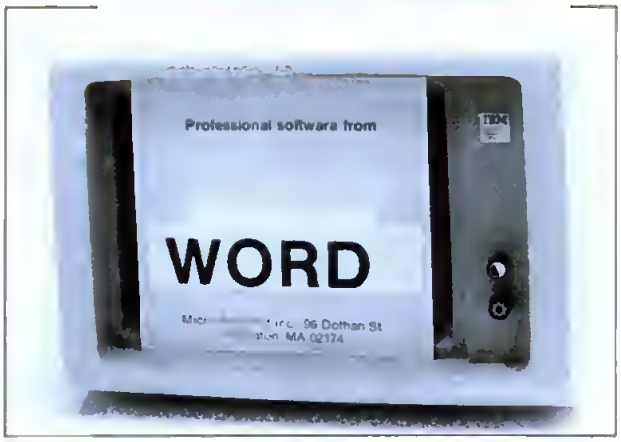
A test generation and storage program for educators. The menu-driven program includes the ability to generate tests with random selections of up to 150 questions from any combination of subjects; user-designed test headers; the ability to print master lists of questions and answers; and password-protected answer keys.

(List Price: $99.95)

Requires: 64K RAM, one disk drive, PC DOS.

A.U. Software
P.O. Box 597
Colleyville, TX 76034
(817) 267-5236

CIRCLE 737 ON READER SERVICE CARD



Word-Jr, Micro Architect Inc.

Windows for C

A screen-formatting program for programmers working in C that allows the screen to be divided into any number of windows, each of which acts as an independent screen. A library of preprogrammed functions provide the ability to clear, write, and control attributes of each window independently; overlay and then restore screens; change the attributes of selected text; and save the contents of windows. Optional wordwrap and automatic scrolling are built into output functions. Line-oriented assembler subroutines provide for rapid screen changes.

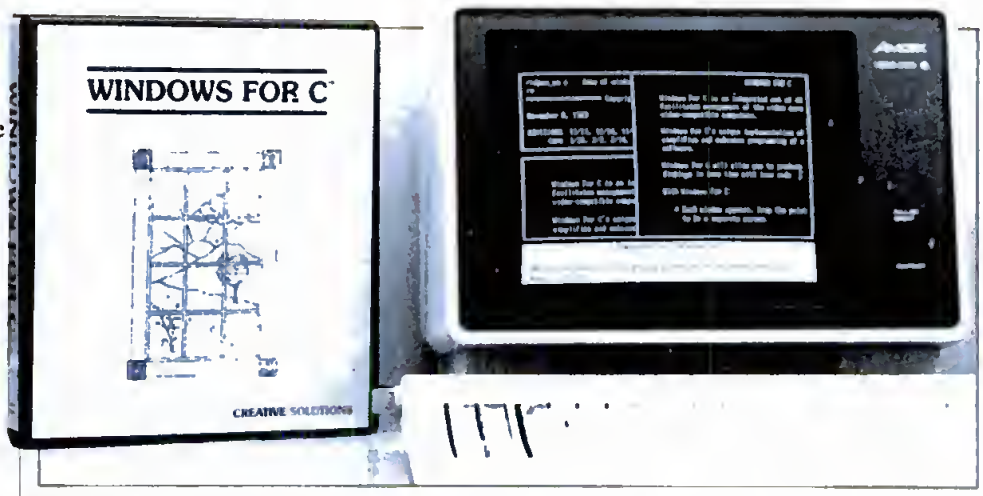
Windows for C includes C language source modules for viewing of multiple ASCII files within several windows, menu display and selection, cursor control, and drawing text-mode graphs. The library of subroutines allows the rapid building of complete routines.

Compilers supported by the *Windows for C* software include C86, Lattice C, Microsoft C, and DeSmet C. *(List Price: $150; Source code $650)*

Requires: Depends upon C compiler used.

Creative Solutions
21 Elm Ave.
Richford, VT 05476
(802) 848-7738

CIRCLE 780 ON READER SERVICE CARD



Windows for C, Creative Solutions

dSOLUTIONS Tools

A set of five software tools for use with the *dBASE II* database management system. The tools, available separately, include a *Multi-Column Report Generator*, *Global Change*, *Versa Label*, *Floppy Tracker*, and *Public Domain Software*.

The *Multi-Column Report Generator* permits the *dBASE II* user to create reports by answering screen prompts. The software allows the user to choose a data file, specify the number of lines per page, specify the number of characters total per line, and specify the fields to be included in the report. The software then generates the appropriate *dBASE II* form file, automatically setting column widths and such. Results can be sent to a display screen, printer, or to a text file.

Versa Label allows the user to store up to nine different label formats for use with a data file. The user chooses the file and starting record from which to print, the number of labels for each record, the number of labels across a page, the label width, the number of characters per inch, and the total label count. When it encounters a blank field, the program will automatically shift up succeeding lines on the labels printed.

Floppy Tracker provides the user with a *dBASE II* file directory for each disk containing data files. The directory lists a disk reference number, the date created, primary user user, file name, file extensions, and comments on the file contents. The remote directories (one for each disk) can be referenced at any time through a master directory file.

Global Change permits the user to automatically search-and-replace character strings within database files. The software allows the user to choose a file, specify the field to search through, specify the replacement string, and pick the record number on which to start.

The *Public Domain Software* module of *dSOLUTIONS* offers sample programs written in *dBASE II* that can be modified by the user for specific applications. Offered in the module are the sample accounting program described in the *dBASE II* manual, a form letter generator, a mailing label manager, and a sophisticated file backup routine.

Each *dSOLUTIONS* tool is available separately, and contains source code which can be modified for particular needs.
(List Price: $39 each)

Requires: 128K RAM, one disk drive, PC-DOS, *dBASE II*.
Data Based Solutions
1975 Fifth Ave., #105
San Diego, CA 92101
(800) 336-6060

CIRCLE 761 ON READER SERVICE CARD

VALUE/SCREEN

An investment analysis program, capable of sorting through thousands of stocks for those that meet up to nine user-selected criteria for investment. The program offers an array of 32 investment variables from which to choose those that meet the user's objectives. Variables offered include critical statistics, projections, and performance rankings of stocks selected by the user.

VALUE/SCREEN is bundled with Value Line data disks, which list pertinent information for 1,650 stocks, nearly 50,000 statistics, on a single diskette. Monthly updates for one year of the Value Line data disks are provided to users of *VALUE/SCREEN* as part of the software package.
(List Price: $495)
Requires: 64K RAM, one 320K drive, PC-DOS.
Value Line, Inc.
711 Third Ave.
New York, NY 10017
(212) 687-3965

CIRCLE 731 ON READER SERVICE CARD

PFS:PROOF

A one-step proofreading program with a 100,000 word dictionary. The program has been designed to work with the *PFS:WRITE* word processing program but can be used with any ASCII word processor.

Requires: 128K RAM, two 320K drives, ASCII word processor.
Software Publishing Corp.
1901 Landings Dr.
Mountain View, CA 94043
(415) 962-8910

CIRCLE 778 ON READER SERVICE CARD

***PFS:PROOF**, Software Publishing Corp.*

The menu-driven program leaves the original text unaltered except for spelling or typographical errors. It flags misspelled words in a document, providing the correct spelling rather than requiring the user to look up the word as a separate operation. It also checks for irregular capitalization, double words and typographical errors, and allows all corrections to be made with single keystrokes.
(List Price: $95)

ConceptVP

A window-oriented operating environment permitting concurrent use of any number of applications programs. *ConceptVP* makes use of pop-up menus, prompt lines, status information, and on-line help screens. Data from any of the applications programs can be exchanged between programs, and composite reports can be generated.
(List Price: $350)
Requires: 256K RAM, two disk drives.
Scientia, Inc.
40 Grove St.
Wellesley, MA 02181
(617) 431-7184

CIRCLE 777 ON READER SERVICE CARD

The Label Maker

A flexible label-making program for Okidata printers, containing printing formats for several commonly used label applications. *The Label Maker* can produce bar code labels, mailing labels, inventory or bin labels, product labels, and price tags. For more specific applications, the software allows the user to custom-format labels according to need.

Data for the labels can be entered at the keyboard or taken from data files as large as 35,000 records, each of which can be 256 characters long, divided into up to 50 fields. Only one master data file need be created to print out different types of labels.

The Label Maker can produce seven different character sets, including bar codes in several different densities and heights, and ASCII characters of three heights and widths. Any of the seven character sets can be printed on the same label in any combination. Up to 50 lines can be printed on a single label.
(List Price: $395)
Requires: 64K RAM, one

Drowning in a sea of solutions?

Help's within reach...

Applications backlog. Technology blur. Mounting user pressures. Staying abreast of changing prices. A tidal wave of problems!

Even if some answers *are* available, you have to go to too many sources and sift through so much information, there's not enough time to locate the solutions to your immediate and most important problems.

Well, help IS within easy reach—in the form of an information system that displays all your current software, hardware and communications options for instant reference.

That system is DATA SOURCES, and you're invited to make it work for you. Simply fill in the coupon and we'll send you DATA SOURCES' 4 quarterly editions at 33% off their regular price.

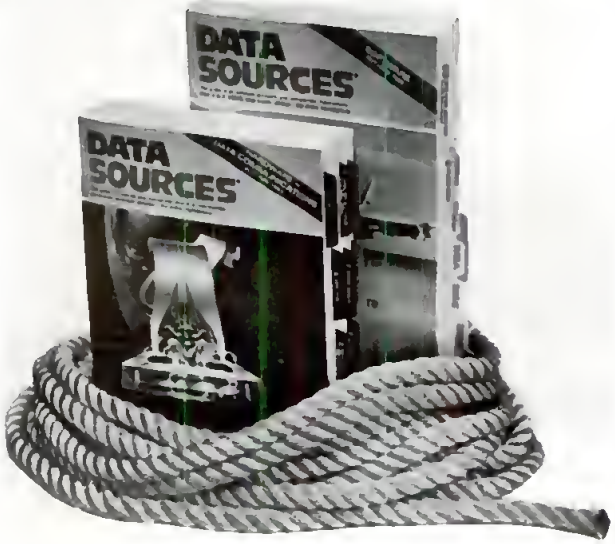
What DATA SOURCES does is organize your options. It guarantees that you've considered all relevant products by guiding you to those with the best possibility of success.

DATA SOURCES is a conveniently sized, extremely well-organized and skillfully indexed 2-volume reference...maintained on a data-base, constantly updated and published quarterly.

YOU GET...

HARDWARE—Over 16,000 products from Micros to Mainframes including peripherals—terminals, printers, memory devices, etc. ...organized by systems compatibility.

SOFTWARE—The largest available inventory of 18,000 business packages for micros, minis, and mainframes including operating systems, utilities, and application packages.



COMMUNICATIONS EQUIPMENT—From modems and multiplexors to local networks, carriers and services, plus all diagnostic and test equipment.

SERVICES, SUPPLIER, SUPPORT—Most complete organized listing of suppliers from installation design to maintenance and data center operations—over 8,000 companies.

NEW FEATURES...

- **Software Index—by package name.**
- **Quick-reference product comparison charts.**
- **Before-you-buy selection criteria and checklist.**
- **Product Hotline—the very latest information on products announced between issues of Data Sources.**

ORDER NOW AND SAVE $60

Yes! Rush me the latest two-volume edition of DATA SOURCES and enter my subscription at $150 for 4 quarterly editions. I save a full 33% off the regular price of $210.

Name_____

Title_____

Company_____

Address_____

City_____ State_____ Zip_____

Telephone_____

Nature of Company's Business_____

Please check appropriate box: ☐ END USER ☐ VAR/OEM

☐ DISTRIBUTOR ☐ DP MFG ☐ OTHER_____

An information product of Ziff-Davis Publishing Company Satisfaction guaranteed.

SAVE TIME...CALL DIRECT **1-800-227-1617**
EXT. 251
(In Ca., 1-800-772-3545 Ext. 251)

Return coupon to:

DATA SOURCES

P.O. Box 5845, Cherry Hill, N.J. 08034.

T282

Residents of Ca., Co., Ct., D.C., Fl., Il., Ma., Mi., Mo., N.J., N.Y., Vt., please add applicable state taxes.

CIRCLE 515 ON READER SERVICE CARD

It all adds up...

AST RESEARCH
MEGA PLUS II.....as low as $299.00
COMBO PLUS II.....as low as $279.00
I/O PLUS II.....as low as.....$139.00
SIXPAKPLUS as low as $249.00

MAIN FRAME
AST-5251 ..... $599.00
AST-SNA $599.00
AST-BSC $599.00
AST-3570 ..... $749.00

MONOGRAPH PLUS
Video Board.....CALL

IDEAssociates
IEDAboard MPR-64 as low as $212.00
IDEAplus XPR-64 CSP . as low as $279.00
IDEAmax ZPR-64 CSP as low as $279.00
IDEAmax ZPR-OK CSPO . as low as.. $229.00
IDEAcomm CPR-3978 ..... $799.00

IDEAdisk
5MB to 45MB Hard-drives with rsmovable Cart. backup.....as low as $1399

QUADRAM
Quadlink 64K $479.00
Quadboard II as low as $309.00
New Expandad Quadboard as low as $279.00
Quad 512 Plus... as low as.....$259.00
Quad I/O..... as low as ... $199.00

QUADCOLOR
Quadcolor I..... $239.00
Quadcolor II (640 x 200)..... $449.00
Upgrade I-II..... $299.00

QUADDISK
5, 12, 20, 27, 72 Meg .. starting at $1799

CHRONOGRAPH
Clock/Calandar $89.99

PARALLEL BOARD
Printer Interface w/6' Cable . . .$89.99

QUADJET
QJ9000 Ink Jet Printer..... ... $749.00

MICROFAZER
Call for Configurations P/P, P/S, S/S, S/P
Starting at..... $159.00

EFAZER
Epson Internal Suffers
8K $69.99
64K..... .....$149.00

AMDEK
MAI..... $489.00

HERCULES
Monochrome Graphics . . . $369.00

EAGLE
PC Color Card..... $229.00

PARADISE
Multi-Display Card $429.00

TAC
IRMA 3270..... ..... $1049.00

PC PLUS PRODUCTS
Plantronics Color Plus. $439.00

PEACOCK
For product information .....CALL

TECMAR
For product information ...CALL

KEYTRONICS
5151 Keyboard ....CALL

MEMORY CHIPS
4164 Ram Chips (set of 9) $49.99

KOALA
Koala Pad w/Micro Painter $95.99

MICROSOFT
Multi-Tool Word w/Mouse $299.00

MODEMS
ANCHOR
Volksmodem $59.99
Mark VI. $169.00
Mark XII $269.00

HAYES
300 ... $199.00
1200B $449.00
1200..... $469.00
SmartCom II..... $75.99
Chronograph..... $199.00

NOVATION
J Cat ... $99.99
Smart Cat Plus $369.00
Smart Cat 103... $159.00
Smart Cat 103/212 ..... $439.00

MICROSTUF
Crosstalk XVI.... ..... $106.00
Remote $99.99

MONITORS
AMDEK
300G $149.00
300A..... $189.00
310A..... $169.00
Color II Plus RGB $369.00
New Color 300,400,500,600,700.....Call
Color 4 T1BM RGB $599.00

BMC
1201 $68.99
1201 Plus . $98.99
9191 Color Plus .. $249.00

NEC
JB 1201 Green..... ....$149.00
JB 1205 Amber $159.00
JC 1216 Color ... $269.00
JC 1216 RGB $429.00

PRINCETON GRAPHICS
Max-12 Mono..... $129.00
HX-12 RGB $499.00
SR-12 RGB. $589.00

QUADRAM
5400 RGB..... $499.00

TAXAN
100G Green . $129.00
100A Amber .. $136.00
210 RGB $269.00
420 Hi-Res RGB $469.00

ZENITH
ZVM 129 Amber . . . $99.99
ZVM 123 Orsan $89.99
ZVM 124 IBM Amber ... $149.00
ZVM 131 Color $309.00
ZVM 133 RGB $429.00
ZVM 136 RGB/Composite.... $469.00

DISK DRIVES
TANDON
5¼" 320K TM 100-2..... ..... $129.00

PERCOM HARD DRIVES
5 Meg w/Controller. .. $1049.00
10 Meg w/Controller.. . . $1349.00
20 Meg w/Controller .. $1899.00

PRINTERS
BMC
BX-80..... ..... $269.00
401Letter Quality $689.00

C.ITOH
8510P $379.00
A10P $589.00
F10-40P... ..... $999.00
F10-55P..... .. $1349.00

COMREX
Comwriter II..... ..... $469.00

DAISYWRITER
2000 . ... $999.00

DIABLO
620.. .. $949.00
630..... .. . . . $1749.00

EPSON
RX80, RX80FT, RX100..... . .. ...CALL
FX80, FX100.....CALL
LQ 1500. .. . .CALL

IDS
Prism 80/132 ...CALL

JUKI
6100... . .. . . . $469.00

MANNESMANN TALLY
Spirit 80..... .... $289.00
160L. . .. $559.00
160L.. .. . . $799.00

NEC
8023 ..... $389.00
8025 ..... $689.00
2050..... ..... $899.00
3550..... ..... $1559.00
7730..... ..... $1799.00
8830..... ....CALL

OKIDATA
82, 83, 84 . CALL
92, 93, 2350, 2410. .....CALL

OLYMPIA
Compact 9 Letter Quality.. ..... $479.00
Compact RO $509.00
ESW 3000.... ... . . . $1449.00

SILVER REED
500... . . . $449.00
550... . $549.00
770... . . . $689.00

SMITH CORONA
TP-1000..... . $449.00

STAR GEMINI
10X. . . $279.00
15X .. $389.00
Radix 10 $599.00
Radix 15 $699.00

TOSHIBA
1340.... . ... $829.00
1351 . .. . $1499.00

TRANSTAR
120P $499.00
130P . . $689.00
315 Color . $499.00

COMPUTER MAIL ORDER

west
800-648-3311
In NV call (702)686-6864, Dept. 140
Order Status Number 686-6864
P.O.Box 6689
Stateline, NV 89449

canada
Ontario/Quebec 800-268-3974
Other Provinces800-268-4559
In Toronto call
(416)828-0866, Dept. 140
Order Status Number. 828-0866
2806 Dunwin Drive, Unit 3B
Mississauga, Ontario, Canada L5L1T1

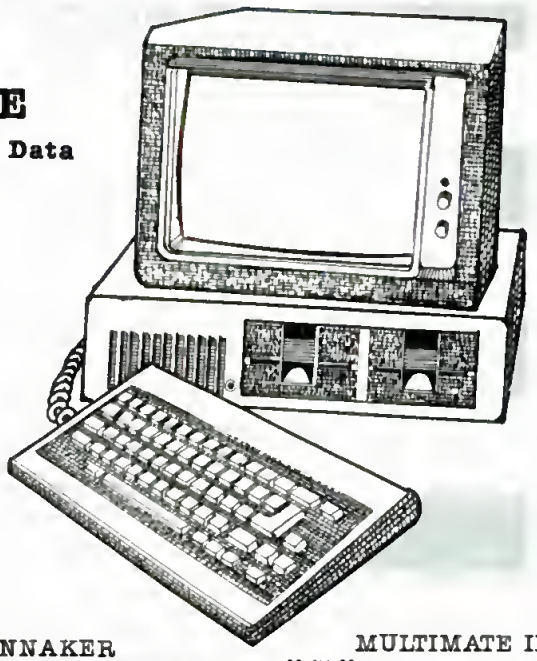
east
800-233-8950
In PA call (717)327-9575, Dept. 140
Order Status Number: 327-9575
Customer Service Number: 327-1450
477 E 3rd St., Williamsport, PA 17701

No risk, no deposit on C O D orders and no waiting period for certified checks or money orders Add 3% (minimum $5) shipping and handling on all orders Larger shipments may require additional charges NV and PA residents add sales tax All items subject to availability and price change Call today for our catalog

the best prices

CALL FOR YOUR FAVORITE PC/COMPATIBLE

Sanyo **Columbia Data**
TeleVideo **Compaq**
Zenith **Eagle**



ASHTON-TATE

Framework	CALL
dBASE II	$299.00
dBase III	$429.00
Friday!	$179.00
Bottom Line Strategist	$269.00
Financial Planner	$419.00

BenchMark

Word Processing	$199.00
Mailing List	$99.99

CDEX

Training Programs	each..$49.99

CONTINENTAL SOFTWARE

Home Accountant Plus	$88.99
1st Class Mail	$79.99

FOX & GELLER

OZZ	$269.00
Grafox	$199.00
dUtil	$89.99
dGraph	$199.00
Quickcode	$199.00

IMSI

4 Point Graphics	$139.00
Bisybase	$189.00

IUS

EasyFiler	$229.00
EasyPlanner	$159.00
EasyWriter II (spell/write/mail)	$249.00

LEXISOFT

Spell Check	$199.00
Spell Binder	$259.00

LIFETREE SOFTWARE

Volkswriter	$115.00
Volkswriter Deluxe	$199.00

LOTUS

1-2-3	$319.00
Symphony	$549.00

MICROPRO

InfoStar	$299.00
DataStar	$179.00
Word Plus PC/The Boss	$349.00
WordStar	$299.00
MailMerge	$159.00
WordStar/MailMerge	$339.00
PRO PACK	$369.00
SpellStar	$159.00
CalcStar	$99.99

MICROSOFT

Multi Plan	$159.00

SPINNAKER

Fraction Fever	$24.99
Story Machine	$24.99
KinderComp	$29.99
Facemaker	$24.99
Hey Diddle Diddle	$29.99
Rhymes & Riddles	$29.99
Snooper Troops 1 or 2	$24.99
Search of Most Amazing Thing	$24.99

INFOCOM

Witness	$29.99
Enchanter	$29.99
Planetfall	$29.99
Suspended	$29.99
Starcross	$27.99
Zork 1, 2, or 3	$27.99
Infidel	$29.99

CENTRAL POINT

PC Copy II	$32.99

DISKETTES

MAXELL

MD-1	$21.99
MD-2	$29.99

VERBATIM

SS/DD	$26.99
DS/DD	$34.99

ELEPHANT

SS/SD	$17.99
SS/DD	$21.99
DS/DD	$25.99

MULTIMATE INT.

Multi Mate	$289.00

PEACHTREE SOFTWARE

Peachtext 5000	$229.00
Peachpack (GL/PIAR)	$219.00

PFS

File	$89.99
Report	$79.99
Graph	$89.99
Write	$69.99

SOFTWARE ARTS

TK Solver	$979.00

SYNAPSE

File Manager Plus	$89.99

VISICORP

VisiCalc 4	$159.00
VisiWord/Spell	$249.00
VisiFile	$199.00
VisiSchedule	$199.00
Desktop Plan	$199.00
Business Forecast Model	$75.99
VisiTutor Word	$89.99
Visi-On Calc	$249.00
Visi-On Graph	$129.00
Visi-On Word	$249.00
Visi-On Mouse	$159.00

MICROMIM

R Base 4000	CALL

PROFESSIONAL SOFTWARE

PC Plus/The Boss	$309.00

FUNK SOFTWARE

Sideways	$49.99

COMPUTER MAIL ORDER

west
VISA
800-648-3311
In NV call (702)588-5854, Dept. 140
Ordsr Status Number: 588-5664
P O Sox 6669
Stateline, NV 89449

canada
Ontario/Quebec 800-268-3974
Other Provinces800-268-4559
In Toronto call
(416)826-0666, Dept. 140
Ordsr Status Number: 628-0666
2808 Dunwin Drive, Unit 3B
Mlss.ssauga, Ontario, Canada L5L1T1

east
MasterCard
800-233-8950
In PA call (717)327-9578, Dept. 140
Order Status Number: 327-9676
Customer Service Number: 327-1450
477 E. 3rd St., Williamsport, PA 17701

CIRCLE 183 ON READER SERVICE CARD

CANADIAN ORDERS All prices are subject to shipping tax and currency fluctuations Call for exact pricing in Canada INTERNATIONAL ORDERS All orders placed with U S offices for delivery outside the Continental United States must be pre paid by certified check only Include 3% (minimum $8) shipping and handling EDUCATIONAL DISCOUNTS Additional discounts are available to qualified Educational Institutions APO & FPO Add 3% (minimum $5) shipping and handling

IBM PC 256K
2X 320 KB DS/DD DISK DRIVES
COLOR CARD
ALL FOR $2599

IBM MULTIFUNCTION BOARD

Quardboard 64K Expandable to 384K Parallel, Serial Port Game Port, I/O Bracket	$ 289.00
Quadboard II64K Memory expansion 2 Serial ports	$ 289.00
Profit Systems Run 9 programs simultaneously. Serial, Port Expandable to 512K	$ CALL

ALSO AVAILABLE
Excellent prices on
STB, AST, MAYNARD

MONITORS

Amdek 300G	$ 144.50
Amdek 300A	$ 155.00
Amdek 310A	$ CALL
Amdek Color II +	$ 385.00
PGS HX-12	$ 495.00
PGS MAX 12 Amber	$ 179.00
Quadchrome	$ 549.00

MODEMS

Hayes 1200	$ CALL
Hayes 1200B	$ 399.00
Qubie 1200 Int.	$ 279.00
Promodem 1200	$ CALL
Bytecom	$ CALL
Bizcomp	$ CALL

VIDEO BOARDS

Quadram Quad color I	$ 215.00
Quadram Quad color II	$ 215.00
PC Peacock	$ 279.00
Tecmar	$ 485.00
Hercules Graphic	$ CALL
BIGraphIx	$ CALL

ALSO AVAILABLE
w/10 MB INTERNAL HARD DISK
$3,599.00
IBM PORTABLE (Available)
$CALL
(Call for other configurations)

***"99 44/100% SYSTEM COMPATIBLE"**

TAVA PC

SYSTEM I	SYSTEM II
128K	256K
2 DS/DD Disk Drives	1 DS/DD Disk Drive
Color Graphic Board	Color Graphic Board
Printer Port	Printer Port
2 Serial Ports	2 Serial Ports
Keyboard	Keyboard
Amdek Monitor	Amdek Monitor
DOS 2.1	DOS 2.1
	10 MB HARD DISK
$1,995.00	$2,995.00

*PC WORLD, April 1984

DISK DRIVES

CDC ½ height	$ 225.00
CDC Full height	$ 210.00
Panasonic ½ height	$ 199.00
Qume ½ height	$ CALL
Teac ½ height	$ CALL
Tandon 10 mb External	$1,195.00
Tandon 15 MB External	$1,395.00
Tecmar 5MB Fixed, 5MB Removeable	$1,795.00
MS 10MB Internal	$ 995.00
Tecmar 10MB W/Expansion Chasis	$2,095.00

TAPE BACK-UP
ALLOY 16.5 Meg @ .7 Mb/Min.
$Call for Special Price
ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE

SPECIAL

LOTUS 1-2-3
$295.00
with the purchase
of any IBM or
TAVA PC

RBASE
$CALL

SOFTWARE

IUS
MICROPRO
MICROSOFT
CONTINENTAL
PEACHTREE
PERFECT
SORCIM
VISICORP

We carry over 100
different lines of
APPLE & IBM Software
10%-45% below retail.

PRINTERS

Epson RX-80	$ CALL
Epson FX-80	$ 499.00
Epson FX-100	$ 685.00
MT-160L	$ CALL
MT-180L	$ CALL
MT Spirit	$ CALL
Okidata 92	$ CALL
Okidata 93	$ CALL
Okidata 2014	$ CALL
NEC 3550	$1,949.00
Juki 6100	$ 525.00
Riteman	$ 275.00
CP-80	$ 295.00
Qume	$ CALL
Star Micronics	$ CALL
DX-15	$ CALL
Brother HR-25	$ CALL
C.Itoh Prowriter	$ 399.00
Starwriter	$1,139.00

CALIFORNIA
22110 Clarendon Street
Woodland Hills, CA 91367
(818) 999-1183

SUPPORT
SELECTION
SAVINGS
TO THE MAX...

MISSISSIPPI
175 East Capitol
Landmark Center
Jackson, MS 39201
(601) 355-8204

VISA

compumax

master charge

CIRCLE 488 ON READER SERVICE CARD

disk drive, Okidata 92 or 93 printer.
Hoff & Associates
2045 S. Arlington Hgts. Rd.,
Arlington Hgts., IL 60005
(312) 364-1065

CIRCLE 776 ON READER SERVICE CARD

Wordfix

A text file conversion program that can take *WordStar*-encoded files and remove all special codes without programming. The resulting ASCII file can be read by any other word processing, communications, or data management software.
(List Price: $49)
Requires: 64K RAM, one disk drive.
Markets International Software
8285 SW Nimbus, #130
Beaverton, OR 97005
(503) 641-7072

CIRCLE 775 ON READER SERVICE CARD

Excelerator

A program automating many of the manual tasks performed by mainframe software systems analysts. *Excelerator* assists the professional analyst in all phases of system breakdown, design, organization, and documentation. It utilizes a menu-driven structure, graphics, a data dictionary, and word processing capabilities to aid the analyst in meeting deadlines.

Beginning with the software's diagramming facilities, the user can design enterprise models, data-flow diagrams, structure charts, record and field layouts, screen definitions, and report layouts. Via a link to an outside word processing program, users can generate narrative descriptions of the system design.

Excelerator, Index Technology Corp.

In its graphics mode, the software can automatically draw over 20 objects including process boxes, external data entities, data stores, offpage connectors, and function boxes. It will also draw different types of connections between these objects. Objects can be added, deleted, or repositioned onscreen through the use of a mouse; connections are automatically redrawn.

The initial release of *Excelerator* is configured for the IBM PC-XT, and includes additional plug-in boards to increase the XT's memory and enhance its graphics capability. The software also employs a digital mouse for rapid screen design and menu selections.
(List Price: $9,500)
Requires: PC-XT: 256K RAM, one disk drive and hard disk, monochrome monitor.
Index Technology Corp.
5 Cambridge Ctr.
Cambridge, MA 02142
(617) 491-7380

CIRCLE 779 ON READER SERVICE CARD

STATPLAN

A statistical analysis and data manipulation program featuring a full-screen editor that utilizes the IBM PC's function keys. Function keys are used to enter and edit data and to initiate a data transformation routine that does arithmetic functions on data, including taking the logarithm, lagging, leading, smoothing, and finding first differences within data. Results may be displayed or printed in either tabular form or as cross plots, histograms, or time series plots.

STATPLAN can read and write Data Interchange Format (DIF) files, allowing transfers of data to and from many spreadsheet programs.

The program's statistical routines include basic descriptive statistics, correlation matrices, one-way analysis of variance, autocorrelations, and multiple regression analysis. The latter function displays residuals of the regression as tables or graphs, and can use calculated values in subsequent regressions. The program can automatically produce forecasts using the regression equations.

STATPLAN guides the user through each procedure by listing available options on the screen.
(List Price: $49.95)
Requires: 64K RAM, one disk drive, PC-DOS.
The Futures Group
76 Eastern Blvd.
Glastonbury, CT 06033
(203) 633-3501

CIRCLE 767 ON READER SERVICE CARD

WindowMaster

A multitasking operating system enhancement for PC-DOS that permits the user to place several applications on screen at one time through the creation of windows. In addition, the software incorporates utilities that permit CP/M-86 programs to run concurrently with DOS software. Windows are opened simply by naming an application program; size, placement, and application of each window is defined by the user.

WindowMaster allows the user to create bar or pie charts and line graphs of data in files without an additional graphics program. The menu-driven program can transfer data between applications and allows the user to define function keys to perform repetitive tasks. More complex tasks between different applications can be performed through user-defined command files, called scripts.

The software contains comprehensive help screens that define each menu selection. In addition, safety features incorporated in *WindowMaster* prevent data loss or corruption through inadvertent shutting down of a system while an application is running. At any time, the user can request status information about applications running under the windowing system, including how much RAM storage each application is using, how much is still available for other applications, and whether any application is waiting for input from the user.

(List Price: $295)

Requires: IBM PC-XT: 256K RAM, two disk drives, PC-DOS 2.0

Structured Systems Group, Inc.
5204 Claremont
Oakland, CA 94618
(415) 547-1567

CIRCLE 760 ON READER SERVICE CARD

ICS Travel Expense Accounting & Control

A program permitting users to account for and control all travel and related expenses, including employee advances, reimbursements, and relocation costs. The system is based on software originally created for use on mainframe and minicomputer systems.

(List Price: Monthly rental $225)

Requires: 256K RAM, two disk drives, PC-DOS.

Interactive Computer Systems
Park II W., Rt. 102
Londonderry, NH 03053
(603) 432-3211

CIRCLE 766 ON READER SERVICE CARD

ACCESSORIES

Ergotron Pedestal Base

A monitor pedestal capable of supporting units weighing up to 70 pounds. The base incorporates a proprietary tilt-friction system which eliminates the need for pins, levers, knobs, or other devices to position the monitor. With one hand, the user can tilt a monitor 15 degrees up or down and turn it 180 degrees in either direction.

The base also features a cable anchor to help prevent wear of signal and power cables.

(List Price: $149.95)

Ergotron, Inc.
P.O. Box 17013
Minneapolis, MN 55417
(612) 724-4952

CIRCLE 774 ON READER SERVICE CARD

Ergotron Pedestal Base, Ergotron, Inc.

Aegis Line Saver, Model LS-240

A standby uninterruptible power system (UPS) designed to provide 240 watts of backup power for up to 10 minutes under a full load. The unit also conditions line power, incorporating four Spike-Spiker voltage surge protected outlets. Other features of the model LS-240 unit include audible and visual power failure warning, test mode indicator and switch, sealed rechargable 12-volt battery, replaceable external fuses, and a 6-foot ground line cord.
(List Price: $485)
Kalglo Electronics Co., Inc.
6584 Ruch Rd.,
E. Allen Twp.
Bethlehem, PA 18017
(215) 837-0700
TWX: 510-651-2101

CIRCLE 773 ON READER SERVICE CARD

Model PC-400 Conditioner

A power line conditioner specifically designed to provide regulated power to a fully configured IBM PC-XT with printer. The Personal Conditioner, Model 400, is rated at 400 volts/amperes, and filters out voltage spikes, line noise of any type, as well as assuring precise voltage and pure sine wave line power for systems requiring up to 3.33 amps of 120-volt power.
(List Price: $349)

***Aegis Line Saver**, Kalglo Electronics Co., Inc. (rear view)*

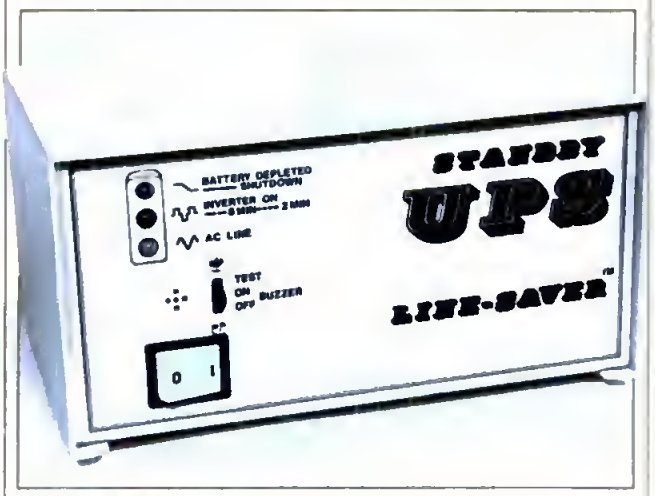
RTE DELTEC
(formerly Gould, Inc.)
2727 Kurtz St.
San Diego, CA 92110
(619) 291-4211

CIRCLE 759 ON READER SERVICE CARD

Compucart

A mobile workstation with space for a PC, monitor, printer, software, and manuals. The unit features a removable back panel, adjustable shelves, and roll-out printer shelf. Large heavy-duty casters allow the unit to be moved as required.
(List Price: $209.95)
Electronic Systems Technology
1023 N. Kellogg St.
Kennewick, WA 99336
(509) 735-8444

CIRCLE 772 ON READER SERVICE CARD



***Aegis Line Saver**, Kolglo Electronics Co., Inc. (front view)*

UNI-1 Pedestal

A tilt-and-swivel pedestal base that can accommodate any non-IBM monitor. The base is 2 inches high and accepts any manufacturer's monitor that can fit on a 13-inch square. The UNI-1 tilts 22 degrees and swivels a full 360 degrees.
(List Price: $49.95)
Curtis Manufacturing
305 Union St.
Peterborough, NH 03458
(603) 924-7803

CIRCLE 758 ON READER SERVICE CARD

PUBLICATIONS

Advanced dBASE II User's Guide

A follow-up to the publisher's *dBASE II User's Guide*, this book provides the advanced user of the database management systems with a collection of tips, techniques, and practical programs compiled over a 2-year period.

Author Adam B. Green has incorporated practical advice on such areas of *dBASE II* programming as creating macros within macros, controlling program flow, repairing damaged data files, debugging a new application, manipulating strings and numeric data, as well as providing several data models and sample programs.

The Advanced dBASE II User's Guide is organized in a manner similar to the

original software manuals. New techniques for *dBASE II* commands are arranged alphabetically under the commands for quick referencing.
(List Price: $29)
SoftwareBanc, Inc.
661 Massachusetts Ave.
Arlington, MA 02174
(617) 641-1235

CIRCLE 763 ON READER SERVICE CARD

PC Accounting Trends (PCAT)

A monthly newsletter devoted to accountants and CPAs using IBM or IBM-compatible microcomputers. *PCAT* offers information on using PCs for conducting audits, tax preparations, client write-ups, and consulting practices. It reports on how CPAs can maximize the uses of personal computers for in-house practice management in such areas as time-billing accounting, staffing, and client databases.

PCAT also reports on commercially-available accounting programs, vertical software, and industry-specific applications of the PC.
(Subscription: $59)
PC Accounting Trends
P.O. Box 435
1850 Union St., #4
San Francisco, CA 94123

CIRCLE 769 ON READER SERVICE CARD

Simply VisiCalc

An outline of the basic concepts of the *VisiCalc* program and a description of how it works. *Simply VisiCalc* provides an overview of the program's capabilities as well as simple examples and detailed illustrations.

Chapters include: "What is the *VisiCalc* program?" "Columns, Cursors, and Coordinates;" "Replication Simplification;" "Performing Plastic Surgery;" "Memory;" "Formats, Functions, and Fundamental Fine-tuning;" "Variations on Values;" "Function Follow-up and Graphs."

The guide helps you do tricks with *VisiCalc*'s labels, formulas, electronic sheets, and columns. It will also show you how to modify its electronic worksheets.
(List Price: $9.95)
dilithium Press
8285 SW Nimbus
Beaverton, OR 97005
(800) 547-2713
(503) 646-2713

CIRCLE 770 ON READER SERVICE CARD

Compaq Software Guide

Available specifically for the Compaq and the Compaq Plus portable computers and written by Harold Chambers, *The Compatible Compaq Software Guide* contains a concise history of the Compaq and detailed reports on the software currently available for this IBM PC-compatible.

Software categories covered in the guide include applications such as accounting and general business, graphics, word processing, spreadsheets. Also listed are personal software and entertainment/educational programs that make use of the Compaq's graphics capabilities.

The book also contains a special section on available enhancement hardware, including reports on expansion cards, printers/plotters, and memory storage devices.

A state-by-state directory of Compaq dealers and a glossary of computer terms make up the appendixes.
(List Price: $21.95)
Prentice-Hall
Englewood Cliffs, NJ 07632
(201) 592-2640

CIRCLE 768 ON READER SERVICE CARD

Simply dBASE II

An easy-to-follow guide to the dBASE II database management system. Chapters include "Why a Database?", "Why *dBASE II*?", "Learning the Lingo," "Change is a Way of Life," "Talking With Your Programs," and others. The guide, by Barbara Chirlian, includes four appendices that provide listings of *dBASE II* commands, functions, configuration parameters, and a glossary of necessary terms.
(List Price: $9.95)
dilithium Press
8250 SW Nimbus, #151
Beaverton, OR 97005
(800) 547-1842
(503) 646-2713

CIRCLE 762 ON READER SERVICE CARD

New on the Market Submission Guidelines

1. Please include the retail price, distribution methods, and details of both hardware and software requirements needed for an end-user to properly use your new product. For software especially, this includes required amount of RAM, number and type of disk drives, operating system(s) supported, and any peripheral equipment needed.

2. Releases should be typewritten double-spaced on one side of the paper. Copies of advertisements for the product may be included, but in most instances we need more information about a product than is typically included in an ad.

3. Include telephone contacts for marketing and technical questions.

4. If available, include black & white glossy photos of the product, 4 × 5 in. or larger.

Please note that all products are run on a space available basis. It is impossible to guarantee publication of a product announcement for any particular issue.

Inclusion in **New on the Market** is at the exclusive discretion of the editors.

COMPUTER DISCOUNT PRODUCTS

HUGE Inventories • IBM Specialists

★ ASK ABOUT OUR FAIR PRICE POLICY – *IT'S GUARANTEED!* ★

Epson FX-100

$699.

CDP IS YOUR AUTHORIZED MicroPro. DEALER

INFOSTAR (w/Starburst)	269.99	SUPERSOFT	149.99
PRO OPTIONS	199.99	WORDSTAR	259.99
STARBURST/INDEX	139.99	WORDSTAR PRO	379.99

INFOCOM

DEADLINE/ENCHANTER	ea32.99
INFIDEL/WITNESS	ea32.99
PLANETFALL	32.99
SORCERER	37.99
ZORK I, II, III	ea24.99

Continental

FCM/1st CLASS MAIL	71.99
HOME ACCOUNTANT	84.99
PROPERTY MANAGEMENT	329.99
TAX ADVANTAGE	44.99
ULTRAFILE	119.99

IBM SOFTWARE

ALPHA Typefaces	79.99
ASHTON TATE dBASE II	379.99
Friday	179.99
Encyclopedia	59.99
BRODERBUND Loderunner	24.99
Serpentine	24.99
CROSSTALK	139.99
LIFETREE Volkswriter	119.99
MASTERTYPE	26.99
MICROLAB Miner 20-49er	27.99
MICROSOFT Flight Simulator	34.99
Multiplan	165.99
Word	239.99
Word w Mouse	315.99
NIGHT MISSION PINBALL	32.99
NORTON UTILITIES	55.99
PC Crayon	49.99
PFS File	89.99
Graph	89.99
Report	79.99
Write	89.99
SIERRA ON-LINE Crossfire	21.99

DOLLARS AND SENSE

MONOGRAM **$109.99**

IBM HARDWARE

KOALA TOUCH TABLET

$95.99

½ Height DS/DD Drive	239.99
AST I/O Plus (w All Options)	269.99
Mega Plus II (w All Options)	265.99
Six Pack Plus (w/All Options)	269.99
HAYES 300 Baud Smartmodem	209.99
1200 Baud Smartmodem	499.99
1200B Modem	424.99
KRAFT Joystick	44.99
Paddle	34.99
MICROSOFT Mouse	129.99
NOVATION 103 Smart Cat	169.99
103/212 Auto Cat	399.99
Access 1-2-3	449.99
PLANTRONICS Color Plus	375.99
TG Joystick	44.99
TITAN 64K Board	499.99

MONITORS

USI for IBM *NEW!*	*$CALL*
AMDEK 310A (Amber)	*$CALL*
MAX 12 (Amber) *NEW!*	119.99
PRINCETON RGB HX-12	485.99
TAXAN 420 RGB	499.99

QUADRAM

MICROFAZER Par/Par 8K	129.99
MICROFAZER Ser/Ser 8K	139.99
QUADBOARD (64K) I or II	269.99
QUADCOLOR I	205.99
QUADCOLOR I UPGRADE	209.99
QUAD 512 + (64K)	219.99

DISKETTES

	10	100
DYSAN 5" SS/DD	31.99	299.99
DYSAN 5" DS/DD	38.99	369.99
MAXELL 5" SS/DD	27.99	259.99
MAXELL 5" DS/DD	37.99	359.99
VERBATIM 5" SS/DD	24.99	235.99
VERBATIM 5" DS/DD	35.99	344.99

APPLE

CALL FOR PRICING
Complete Product Lines Available For Apple!

BEAGLE Apple Mechanic	19.99
DOLLARS & $ENSE	69.99
FLIGHT SIMULATOR II	37.99
KENSINGTON System Saver	64.99
KOALA TouchTablet	65.99
KRAFT Joystick	44.99
MOCKINGBOARD	119.99
ORANGE MICRO Grappler +	114.99
PFS Write (IIe)	99.99
PADDLE ADAPPLE	34.99
THUNDERCLOCK	99.99
ULTIMA III	39.99
VIDEX Ultraterm	249.99

ACCESSORIES

FINGERPRINT (Epson Enhancer)	44.99
FLIP n FILE (25)	17.99
FLIP n FILE (50)	27.99
FLIP n FILE (Original 5¼")	17.99
KENSINGTON PC Saver	29.99
LIBRARY CASE	1.99
NOVATION Access 1-2-3	469.99
PRINTERS C-ITOH	379.99
Epson FX80	549.99
Epson RX80	349.99
Okidata 82-93	*$CALL*
PRINTER STAND Sm (Pixgls)	24.99
Lg (Pixgls)	29.99
RIBBONS-FX, MX, RX80	4.99
FX, MX, RX100	7.99
Many Others Available	*$CALL*

EDUCATIONAL SOFTWARE!

SPINNAKER Facemaker	23.99	Alphabet Zoo	21.99
Fraction Fever	23.99	Delta Drawing	29.99
Kindercomp	21.99	Story Machine	23.99
Snooper Troops I & II	29.99	EDUWARE Algebra I	26.99

– SINCE 1977 –
RETAIL SHOWROOMS IN CALIFORNIA:
San Jose • (408) 241-2300
San Mateo • (415) 571-1658
San Francisco • (415) 626-2244

COMPUTER DISCOUNT PRODUCTS
860 S. Winchester Blvd., San Jose, California 95128
MAIL, PHONE, WILL-CALL SERVICE FROM 6AM (PST)
– CALL (408) 985-0400 –

- No Charge For Credit Cards
- Prices Subject To Change
- Software Sales Are Final
- International Orders Welcome
- Min. UPS Chg. $4 + Ins.
- Min. US Postal Chg. $10
- P.O.'s Welcome – Call First

VISA AMERICAN EXPRESS MasterCard

In simple, BASIC LANGUAGE: For PC products, our

HARDWARE

ALLOY
Cartridge back-up system for PC, XT and compatibles 16.5 meg on a single cart. 1795.00
Interface card included

AST RESEARCH
AST 6-PACK PLUS multi-function board for IBM-PC 64K-384K expandable memory, clock calendar, 1 serial and 1 parallel port, includes Super Drive and Super Spool software (optional game port adapter is available)
6-Pack Plus 64K 269.00
For game port option add 34.95
64K RAM set to upgrade memory by 64K 59.00

MICROSOFT
New! Mouse with software . . 129.95

QUADRAM QUADBOARD
Quadboard is expandable from 64K-256K. 1 serial port, clock calendar and quadmaster software incl.
64K Quadboard 259.50
256K Quadboard 399.00
New Expanded Quadboard, expandable from 64K-384K, 1 parallel 1 serial and game port I/O bracket and quadmaster software
64K quedboerd 264.95
384K quadboard 569.00
QUADLINK-allows running of Apple II software on IBM-PC 439.00

STB
RIO PLUS Multi function board 64K-384K exp. memory. 1 serial 1 parallel and game port (game port cable included) clock calendar and PC Accelerator software.
Rio Plus 64K 254.95

MOUSE SYSTEMS
Mouse with pop-up menus Design your own menus for most programs software included *(requires RS-232 port)* 194.50

PRINTER BUFFERS
PRACTICAL PERIPHERALS-Print butter connects between your computer and printer (cable required from computer to butter)
32K in-line parallel with copy feature 199.00
64K in-line parallel with copy feature 244.95

QUADRAM MICROFRAZER
Perallel printer butter with copy feature
MP-16 16K (upgradeable) . . . 139.00
MP-64 64K (upgredeable) . . . 195.00
MP-256 256K (upgradeeble) 595.00

TALLGRASS
Hard drive sub system with backup
TG-3012 12 mg. w/backup . . 2995.00
TG-3020 20 mg. w/backup . . 3395.00
Interface for PC included
DC-600 Data cartridge 34.95

CURTIS
PC-II Pedestal for IBM monochrome display 54.95
AD-1 Adapter for use of PC-I with Princeton or Quadrome color monitor 7.95
UNI/1 Universal tilt and swivel base for use with monitor 36.95
EC-I 3' monochrome extension cable 36.95
EC-II 3'-9' coiled keyboard extension cable 27.95

DISPLAY CARDS

HERCULES Grephics Card (Monochrome) 339.00
PLANTRONICS Color Plus . . . 369.95
PARADISE Multi Display Card (Color & Monochrome) 384.95
New! STB GRAPHIX Plus (Color & Monochrome) 359.95
QUADCOLOR-1 color cerd for PC 194.50

MODEMS

ANCHOR AUTOMATION MODEM
Signelman Mark XII 1200 Baud modem (RS-232C) 269.00

HAYES MODEMS
Smartmodem 300 . . . . . 199.00
Smartmodem 1200 . . . . . 495.00
Smartmodem 1200B internal with Smartcom II 419.95

VEN-TEL MODEMS
PC Half Modem-Internal 300/1200 modem fits in short slot of XT with Crosstalk XVI 449.00
PC Modem-1200 Internal full size modem 300/1200 Baud with Crosstalk XVI 399.95
1200 Plus-External 300/1200 modem . . . . . *Special!*
(Requires RS-232 Card and Cable)

MONITORS

AMDEK
300G-12" Green 139.95
300A-12" Amber 154.95
310A-(to use with IBM Monocard) Amber 169.95
Color II Plus-12" Hi-res RGB Color . . . . . Call

PRINCETON
HX-12 Hi-res RGB Color 469.95
MAX-12 Monochrome (to use with Monochrome Card) Amber . . 179.00

TAXAN
420-12"-super hi-res RGB color 449.00
122-12"- Amber for PC *(requires monochrome card)* . 159.00
121-12"-green for PC *(requires monochrome card)* . 169.95

PRINTERS

QKIDATA
OKI-92 . . . . . Call
OKI-93 . . . . . Call
OKI-84 . . . . . Call
OKI-82 . . . . . 324.00

PANASONIC
KXP-1090 80 CPS F/T 299.00
KXP-1091 120 CPS F/T . . . . . Call

EPSON
RX-80, RX-80 F/T . . . . . Call
FX-80, FX-100, MX-100 . . . . . Call

QUADRAM
Quadjet Color Ink Jet Printer 599.95
ACC Kit for PC Incl (cable req.)
Perallel Printer Cable for PC . 26.95

DIABLO
630 API Letter Quality . . . . Call
Trector Feed 269.00
Perallel Cable for AP-I to PC . 45.00
Sheet Feeder 479.95

NEC
3550 letter quality 33 CPS . . 1825.00
2050 letter quality, 18 CPS . . 894.96
Tractor Feed 3550/2050 . . . . . 209.95

JUKI
6100 18 CPS Letter Quality . . . Call

SILVER REED
EXP-550 (16 CPS) 519.95
EXP-770 (30 CPS) 879.00
Tractor Feed for EXP-550 . . . 124.95

BROTHER
HR-15 13 CPS 399.00
HR-25 23 CPS 699.00
Tractor Feed 124.95
Single Sheet Feeder 224.95

A-B PARALLEL PRINTER SWITCH BOX
Cables to Printers Included. $134.95
(Cable from Computer to A-B Box not included)

TI-855 . . . . . Call

August specials at

HARDWARE

VEN-TEL
Hayes Compatible Internal Modem for IBM PC
300/1200 Baud Auto Dial Auto Answer
Call for Super Price!

VEN-TEL
1200 Plus External 300/1200 Baud Modem
Auto Dial Auto Answer Hayes Compatible
$379.95

NOVATION SMARTCAT
Auto Dial Auto Answer
300/1200 Baud External Modem
$369.95

PERSYST TIME SPECTRUM
Memory Expansion 64K-384K, Parallel & Serial
$259.95

FLOPPY DISKS

(Packed 10 per box)

	SS/DD	DS/DD
IBM 5¼"		34.95
MAXELL 5¼"	23.95	33.95
FUJI 5¼"	23.95	31.95
TDK 5¼"	23.95	34.95
NASHUA 5¼"	17.95	24.95

SOFTWARE

ASHTON TATE
Dbese II . . . . . *Special!*
New! Ashton Tate DBASE III . . *Call*
Ashton Tate Framework . . . . . Call

ATI TRAINING
Treining for Lotus 1-2-3 . . . . 49.00
Training for Wordstar 49.00
Treining for Dbase II 49.00
Training for Multiplan 49.00
How to use your IBM-PC or XT 49.00
How to use your COMPAQ . . 49.00

BEST PROGRAMS
PC/Tex Cut 149.95
PC Protessional Finance II . . 149.95

BPS
BPS-Business Grephics *(requires color card)* 179.95

BUSINESS SOLUTIONS
JACK-2 . . . . . *Special!*

CBS SOFTWARE
Managing for Succaas
People Management 59.00
Personal Development 59.00
Micro SpeedRead 87.50
Mestering The SAT 99.50

CDEX
Training for Wordstar 44.95
Managing Your Business with Lotus 1-2-3 . . . . . 44.95
Training for Dbase II 44.95

CONCENTRIC DATA SYSTEMS
C.I.P. Concentric Information Processor 249.00

CONTEXT
MBA *(requires 256K)* 429.00

DAYFLO
Daytlo (XT/256K) 299.95

DIGITAL RESEARCH
Concurrent CP/M w/windows 229.00
CP/M 86 . . . . . 36.00
DR LOGO *(req. color card)* . 64.95
C-Compiler (PC DOS) . . . 219.00
For other **DR** *products* **CALL**

DOW JONES
Connector 39.95
Market enelyzer *(requires color card)* 259.00
Market manager 219.00
Merket microscope 499.00
Spread sheet link 179.95
Investment Evaluator 109.95

FUNK SOFTWARE
Sideways 45.00

FOX & GELLER
Quick Code (MS DOS) 149.00
Dutil (MS DOS) 54.95
OZ (256K) *(req. color card)* . . 249.95
dGreph *(requires color card)* . 159.95

HARVARD SOFTWARE
Harvard project manager . . *Special!*

HARVARD ASSOC
PC Logo *(req. 128K/color card)* 99.95

HERITAGE SOFTWARE
Smertkey II 49.95

HOWARD SOFTWARE
Tax Preparer 1984 . . . . . 179.95

HUMAN EDGE
The Management Edge (128K) 165.00
The Sales Edge (128K) 165.00

IUS
Accounts Receiveble 289.95
Accounts Payable 289.95
General Ledger 289.95
Order Entry 289.95
Payroll 349.95
Easywriter II System 189.95

KNOWARE
Knoware *(requires color card)* 64.50

LIFE TREE
Volkswriter Deluxe 164.95

DRIVE is to MONITOR CRISP, COMPATIBLE savings.

47th St. Computer

SOFTWARE

KNOWLEDGEMAN
Data Base Manager
$274.95
*FREE** K Paint and K Graph w/Knowledgeman ($325 Value)!
* *Limited Quantity*

HARVARD SOFTWARE
Harvard Project Manager
$239.95

ASHTON TATE
D Base II Version 2.4 with Tutorial
$297.50

SORCIM SUPERCALC³ $199.95

JACK-2
Integrated Software *by* Business Solutions
$279.95

- *No surcharge for credit cards.*
- *Prompt and efficient service.*
- *Extensive inventory of PC products.*
- *Knowledgable and experienced sales staff.*

We stock an extensive inventory on IBM PC® , XT® , Apple® , Franklin® , Kaypro® , Compaq® , Hyperion® , Columbia® , Olivetti® , Eagle® , etc.

LIVING VIDEOTEXT
Think Tank *(requires 256K)* . . 134.00

MECA
Andrew Tobias Managing Your Money (128K) 144.95

MICRO DATA BASE SYSTEMS
Knowledge Man . . . . . *Special!*

MICRO PRO
Wordstar Professional includes Wordstar, Mailmerge, Correctstar, Star Index and Training Disk 359.95
Wordstar 3.3 . . . . . 259.95
INFOSTAR PLUS Version 1.8 249.95
Includes Star Burst

MICRORIM
R base 4000 *(requires 256K)* 319.95
Extended Reportwriter 96.50
Clout 139.00

MICROSOFT
Multipian 129.95
Macro Assembler 69.50
C. Compiler 329.00
Word w/Mouse - Version 1.1 . 289.95
Word - New Version 239.95
Fortan Compiler 224.95
MS PASCAL Compiler 194.95

MICROSTUF
Crosstalk XVi 99.95

MONOGRAM
Dollars & SenSe 104.00

OPEN SYSTEMS ACCOUNTING
256K req.
General ledger 439.00
Accounts receivable 439.00
Accounts payable 439.00
Payroll 439.00
Inventory 439.00
Sales order processing 439.00
BI-286-D required to run 149.95

SAVE!!! Order 3 or more Open System accounting modules at once and deduct $10.00 per module *(BI-286-D not included)*

OSPREY ACCOUNTING SOFTWARE
General ledger 219.00
Accounts receivable 219.00
Accounts payable 219.00
inventory 219.00
Sales invoicing 219.00

PBL CORP
Letterform 1000 DOS 1.1 . . . . 64.00
Letterform 1000 DOS 2.0 . . . . 64.00
Personal Investor 124.00

PC SOFTWARE
PC Crayon 29.95
Executive Picture Show 124.95

PETER NORTON
Norton Utilities 49.95

PROFFESIONAL SOFTWARE
Word Plus PC with BOSS . *Special!*

ROSE SOFT
Prokey 3.0 . . . . . 64.00

SOFTSTYLE
SET-FX + (f/Epson printers) . . 49.95

SOFTWARE INTERNATIONAL
Open Access *(requires 256K/color card)* 379.95

MULTIMATE
Multimate Vers. 3.22 . . . . . 269.95

SOFTWARE PUBLISHING
PFS File 89.95
PFS Report 79.95
PFS Graph 69.95
PFS Write 89.95

SSI
Word Perfect with Speller . . 269.95

SORCIM
Supercalc³ . . . . . *Special!*

VISICORP
VisiCalc 4 . . . . . 179.00
VisiWord Plus w/Spell 139.00
VisiFile Vers. 3.0 . . . . . 99.95
VisiTrend/Plot *(req. color card)* . 69.95

VM COMPUTING
Relay communication software 99.00

Remember Our Name — It's all the Memory You Need.

47st. Computer
Computers and Business Equipment

A Division of 47st. Photo Inc.

67 W. 47th St. • 115 W. 45th St.
New York, N.Y. 10036

Mail Order Address:
36 E. 19th St., N. Y., N.Y. 10003

212-260-4410

TOLL-FREE OUT-OF-STATE 800-221-7774

STORE HOURS:
Sunday 10-4, Monday-Thursday 9-6, Friday 9-2

We accept MC, Visa, American Express & personal checks (will not cause delays if approved). Minimum shipping and handling $4.95. Software found to be defective will be replaced immediately. Defective hardware will be repaired or replaced at our discretion within the warranty frame of manufacturer. Defective items must be sent to 32 East 19th Street, New York, N.Y. 10003. Att: Service Dept. Prices herein are for mail order and phone orders only. Store prices may differ. Some items are subject to availability. Due to manufacturers specifications, the prices may change beyond our control. This ad supersedes all other ads.

Keep in touch with the latest items on the market and our up-to-date sale prices by checking our weekly ads in the National editions of the N.Y. Times and Wall Street Journal.

IBM® is a registered trademark of International Business Machines Inc

CIRCLE 242 ON READER SERVICE CARD

PC BlueBook

Rates and Information

PC: BlueBook is a high-response, low-cost source for advertising in the fastest growing computer market in the world. Advertisers choose between set categories and may include a logo. Display advertisers may cross-reference to their current display ad.

Circulation: 150,000 Paid Circulation Rate Base. Readership: 300,000 Est.

AD STYLE

1 line Heading (25 characters maximum). 7 lines Body Copy (45 characters per line). 4 lines for Company name, address and telephone.

RATES

Per Issue: $150. Additional Lines: $15 per line. Logos: $300 (4 issues). Minimum Order: 4 issues. Terms: Prepayment is required. Check, money order, American Express, Diners, VISA or MasterCard are accepted.

DEADLINES

July 26th for the October 2nd issue, on sale September 11th. Send your ad and prepayment to: PC BlueBook, Classified Advertising, 12th Floor, One Park Avenue, New York, NY 10016. Advertising sales: (212) 503-5115. Customer service: (212) 503-4506

ACCESSORIES FURNITURE

EXECUTIVE FURNITURE
For Executive Computing. Finely finished hardwood furniture for your IBM PC. Monitor stand positions easily & tilts. Computer stand mounts system unit vertically. Each handcrafted matched set available in Oak, Cherry, or Walnut. Set $330. MC/VISA. Free brochure. Write or call.
PC STAND-UPS
120 Franklin Road
Oakridge, Tenn. 37830-0367
(615) 483-6411

ACCESSORIES SUPPLIES

MAXELL DISKS/FLIP N FILE
MD-1 (s/s d/d) Bx10 25.95, MD-2 (d/s d/d) Bx10 37.00. Flip n File 25 19.95, Flip n File 15 6.95, Flip n File 50 w/lock 29.95, Flip n File 50 original 19.95. Call or write for information and price list. California residents please add 6.5% sales tax.
ETA Systems
366 Allendale
Pasadena, CA 91106
(213) 945-1931

DISKETTES + FREE SOFTWARE
For IBM PC, ALL 10 diskettes—only $29.95 DS/DD 3—year guarantee
Plus*****
SOFTWARE Includes
Labels, invoicing, calendar, games, IBM utilities—30 TOTAL.
$29.95 + $2.00 shipping. VISA/MC, check/MO.
GLC SYSTEMS
2729 Winchester Pike
Columbus, Ohio 43232
(800) 332-1225, outside of Ohio (orders only).
(614) 237-1077 In Ohio

RESET BUTTON FOR IBM PC
Hungup, out to never-never land, locked-up or locked out of your keyboard? No need to turn your machine off and on and wait and wait. Reboot time is about the same as ctrl-altdel. This kit easily installs with simple step-by-step instructions. Kit fits IBM PC or PC/XT. Send $29.80 (add 6% in MN)
RESET CORPORATION
PO BOX 14809
Minneapolis, Minnesota 55414
(612) 489-5892

BUSINESS OPPORTUNITIES

ENERGY MGMT—GE TIME SHARE
Entrepreneurs needed to establish Dealers and generate sales for incredible new Energy Conservation Analysis System. Includes hardware, software, and royalties from access to massive energy data base and programs on General Electric's Nationwide Timesharing System. IT'S WORTH A CALL!
GENERAL ENERGY TECHNOLOGIES
250 E. 17th St., #G
Costa Mesa, CA 92627
Box 2062 Newport Beach, CA 92660
(714) 645-7733

VENDORS & DISTRIBUTORS
WANTED: Independant software vendors, distributors & consultants for nationwide software distribution network. SOFTWARE VENDORS-Do you have limited resources for nationwide distribution? DISTRIBUTORS/CONSULTANTS-Are you looking for new software packages to represent? Call Ed Sager for details & application.
SGR SYSTEMS, INC.
STATION SQUARE III Suite 207
Paoli, PA 19301
(215) 296-7566

COMPATIBLES

PANASONIC SR. PARTNER!
IBM PC compatible portable—8088 CPU, 128K memory, dual 360K drives, 9" green screen, built in thermal printer, parallel port, serial port, RGB port. Software included: MS DOS 2.11, Wordstar, Visicalc, pfs file, pfs report, pfs graph, G.W. basic. Send cashiers check or M.O. for $2495 shipped. Wisconsin res. add tax—90 day warranty, all sales final.
DISCOUNT COMPUTER ACCESSORIES
445 North Pine
Reedsburg, Wisconsin 53959

COMPUTER TRAINING

IBM XT TRAINING VIDEO TAPE
No time to read manuals? Bypass them with this amusing instructional video! In 30 minutes this tape explains the basics including: technical jargon & parts of the machine, the disk operating system, beginning setup procedures, special keys & important commands. Avail. VHS, BETA 1&2 $49.95
H.E.R. PRODUCTIONS, INC.
2500 Kuhio Ave.
Honolulu, HI 96815
(808) 922-0811, Attn. Kiki Rolles

THE TRAINER
"How to use your PC in 10 easy video lessons" for the IBM PC and XT. An award-winning video that makes you computer literate in 4 hours. Suggested retail .. $69.50 in Beta and VHS. Coming soon-PCjr and several generic software titles. Just released: Interactive Video-disc Tutorial demo for the IBM PC.
KENNEN PUBLISHING
150 Shoreline Hwy., Bldg. E
Mill Valley, CA 94971 (800) 428-7777
(415) 332-5828 in Cal.

1-2-3-™VIDEO TRAINING!!!
The FASTEST-EASIEST-CLEAREST 1-2-3 training on the market .. in use by: IBM, Exxon, US Army, Dept. of Educ., GM, Boeing, GE & many more! SELF-PACED, PLAIN ENGLISH, HANDS-ON teaching. "Intro to 1-2-3" is a 2 hr. 23 min. videotape, disk, guidebook, xtra book/disks for seminars!

LEARN-PC VIDEO SYSTEMS
3601 Wooddale Avenue South
Minneapolis, MN 55416
800-LEARN-PC (800)-532-7672

CONSULTANTS

GEORGIA
CUSTOM PROGRAMS/SUPPORT
Why have someone else's software when you can have your own? We write programs to meet your requirements and solve your problems. Business and health care management applications a specialty. Over 15 years experience in data processing. Let it work for you!
YOUR SOFTWARE CO.
PO BOX 2672
Norcross, GA 30091
(404) 448-1274

BLUEBOOK

DISKETTE COPY SERVICE

EACH A PERFECT DRIGINAL

Duplication and formatting for virtually all popular personal computers. Downloading 8 inch CP/M to most 5¼ inches CP/M. IBM EBCDIC to CP/M conversions. We are experts in IBM 1S and 2S duplication. Copy protection for IBM-PC. Downloading CP/M 8 inch or CP/M 5¼ inches to IBM-PC DOS or CP/M-86. Five days turn around for orders. 2 K quantity.

DISCOPYLABS
1600 Wyatt Drive, Suite 10
Santa Clara, CA 95054
(408) 988-0438

ALLENBACH INDUSTRIES, INC.

Allenbach created the industry, and we've since been imitated—but never duplicated. Copies supplied on OEM quality Allenbach LIFETIME GUARANTEE diskettes, now available in a variety of colors. Virtually all formats and systems. Copy protection, serialization, downloading and packaging available. Rapid delivery on 100 to 1,000,000 copies.

ALLENBACH INDUSTRIES, INC
2101 Las Palmas, Suite A
Carlsbad, CA 92008
(800) 854-1515, (619) 438-2258

BLANKET DRDER SERVICES

Diskette duplication, packaging, stocking and drop-shipping services based on your long-term needs. Place a blanket order with releases as you need them for large or small quantities at a fixed price. No extra charge for "mastering", label printing or application.

STAR-BYTE, INC.
2564 Industry Lane
Norristown, PA 19401
(215) 539-4300

COMPUTER MEDIA PRDDUCTS

SOFTWARE DUPLICATION ANQ formatting on QEM quality diskettes. Copy protection, serialization, custom packaging and private labeling available. Conversion and downloading for CP/M and MS-DOS. Guaranteed fast delivery. A dealer that carries accessories and supplies. Master distributor for Verbatim, Memorex, 3M & CDC.

COMPUTER MEDIA PRODUCTS
5482 Complex Street
San Diego, CA 92123
(619) 565-7802

9 TRACK TAPE TO DISKS

Conversion from ASCII or EBCDIC 1600 BPI magnetic tape (up to 16K blocks) to most 5¼ single, dual or quad diskettes. High speed automated process verifies transfer. Quality guaranteed. Only FIVE CENTS per thousand characters plus $3 per diskette. $50 minimum.

AUSTIN SCIENTIFIC INC.
1259 El Camino #260
Menlo Park, CA 94025
(415) 323-6338

GIVE YDUR SOFTWARE COLOR

Our color disks and color graphic disks can make your software stand apart from the rest. We offer rapid duplication in over 600 formats, including Commodore 64. We guarantee 100% verified flawless copies. Serialization, copy protection, labeling, packaging and shrink—wrapping also available.

Western Transdata Inc.
DISK DUPLICATION

Western Transdata, Inc.
1701 E. Edinger Ave.-Ste. A7
Santa Ana, CA 92705
Call (714) 547-3383 collect.

HARDWARE
ADD-ON BOARDS

EPROM & MP PROGRAMMER

PC compatible PROM-2000 card can program 2716, 32, 32A, 64, 128, MCM 68764 EPROMS and also 8748/49/51 processors. The software (CP/M-86, PLDOS) can read, verify and program eproms and uses fast programming algorithm. The zero insertion socket is mounted on an external box. The external box for BI-POLAR proms and PAL is also available.

ADVANCED MICROCOMPUTER SYSTEMS, INC.
6802 N.W. 20th Ave.
Ft. Lauderdale, Florida 33309
(305) 975-9515

GUARANTEED LOWEST PRICES

IBM PC with 128K and 2 disk drives-$2495. IBM PC with 128K, 10 MB hard disk (like XT)-$3795. Quadram 64K clock, serial, and parallel-$259. Tandon 360 KB DS/DD-$224. Amdek Color II monitor-$409. Hayes 1200B modem-$419. Printers, Software, IBM Compatibles, PCjr-at dealer cost + 5%.

DATA GURU INTERNATIONAL, INC.
75-23 Broadway
Elmhurst, NY 11373
(212) 429-5178

AST/MAYNARD/QUADRAM/HAYES

AST MegaPlus (64K) $269, SixPack (64K) $269. I/O Plus $114. Extra Parallel, 2nd serial or game $35. MAYNARD Disk Controller $162. Sandstar Series $Call. QUAQRAM Quadboard $269. Quadcolor I $199. HERCULES card $349. Set of nine 64K chips $55. HAYES modems $Call.

VLM Computer Electronics
10 Park Place
Morristown, NJ 07960
(201) 267-3268

PCool™—COOLING FAN

Solves heat related problems from expansion cards and/or hard disk. Mounts on front of PC or XT chassis, behind front bezel. Fan is not visible. Easy installation, all parts included. PCool™ retails for $99.95 (US funds), plus shipping. Call or write for more information. Quantity discounts available.

ANALYTIC INFORMATION PROCESSING, INC. (AIP)
P.O. Box 966
Danville, CA 94526
(415) 837-2803

64K RAM EXPANSIDN KIT

Set of 9 factory new, tested, burned-in 150NS RAM chips suitable for use in PCII's, XT's workalikes, and memory expansion boards. Satisfaction Guaranteed or money back. Static-shielded shipping. $57.50 Set + 2.50 shipping and handling. Quantity discounts available. VISA/MC, check, M.O., COD's for cash/cashier's check.

CORTEX INCORPORATEQ
603 W. 13th St., Suite 1A-263
Austin, TX 78701
(800) 237-8400 X333/(800) 282-1469 X333 in FLA.

MULTIGRAPH BDARD

Monochrome and color display adapter compatible with IBM PC. Monochrome graphics (LOTUS 1-2-3 compatible) with 720H X 350V resolution. Expandable options include "Soft-scroll" smooth scrolling, 132-column display, high resolution color graphics in 16 colors, and more. Price base configuration $499.00.

PROFIT SYSTEMS, INC.
30150 Telegraph Road
Birmingham, MI 48010
(313) 647-5010

TDTAL PC/XT CDMMUNICATIDN

ELECTRONIC SYSTEMS ENGINEERING proudly introduces two extremely versatile and powerful communications adapters for the PC/XT and compatibles. One is RS-232C serial, the other has 3 fully programmable 8 line parallel ports. Both have full 64K SELECTABLE I/O address decoders. Price is $139.50 each.

ELECTRONIC SYSTEMS ENGINEERING
PO Box 572 Q.T.S.
Portland, Maine 04112
MC/VISA (207) 773-7778

BDDT PC FRDM HARD DISK

FiXT boots from DATAMAC, DAVONG, PEGASUS, PERCOM, GREAT LAKES, XEBEC, ZQBEX, others. Adds XT-like BIOS interface for your disk to IBM PC2. Ends need for installable device drivers. DOS 2.0/2.1 reqd. Plug-in installation. Specify disk/controller model with order $70 + $3 shipping. (CA orders add 6%) MC/VISA.

GOLDEN BOW SYSTEMS
PO BOX 3039
San Diego, CA 92103
(619) 298-9349

"VOICE I/D FDR IBM PC"

Talk back to your PC! Expansion board takes voice input, stores on disk, gives high fidelity playback. Low data storage rate (1-2 kbyte/sec). Runs under PC-DOS. We provide device drivers and demo software. DIALOG/1 with voice I/O for $295, DIALOG/2 with phone interface $495, DIALOG/3 with 300 Modem $595. Send for data sheets.

DIALOGIC

DIALOGIC CORPORATION
164 McKinley Avenue
East Hanover, NJ 07936
(201) 386-0202, (800) 221-0393

HARDWARE
COMMUNICATIONS

VDICE RECDRD/SEND, + MDDEM

NATURAL CONNECTION™ for PC answers your phone, takes voice messages, sends voice messages. Is 300 (opl 1200) band modem, calendar & dictation unit. Autodials 500 numbers. All digital integrated sftw. Salisfaction guaranteed. VISA, MASTERCARD. Order Now Only $849.

NATURAL MICROSYSTEMS CORPORATION
19 Brook Road
Needham, MA 02194
(617) 449-6070

HARDWARE
DISK DRIVES

SMD HARD DISK CDNTRDLLERS AND SUB SYSTEMS

Interphase brings you the most powerful disk controller and disk subsystems available for your IBM PC or PC compatible. You can use any of the dozens of high performance Disk Drives supporting the industry standard SMQ Interface. Capacities range from 16 to 1600 Megabytes, speeds 3-5 times the 5.25" Winchesters and reliable removable media too. Ideal for network file servers or large DBM applications.

Interphase Corp.
2925 Merrell Road
Dallas, TX 75229
(214) 350-9000

DISK DRIVES FDR PC

Qume 142A (½ Ht)	$209
Teac FD55B (½ Ht)	$179
TM100-2, DS, 40T	$209
TM101-4, DS, 80T	$295
CDC 9409 DS, 40T	$219

MAYNARD complete Internal 10MB Winchester Hard Drive System, from $959, WSI $990. VISA/MC or COD.

VLM COMPUTER ELECTRONICS
10 Park Place
Morristown, NJ 07960
(201) 267-3268

BLUEBOOK

HARDWARE/ DISKETTES

SPECIAL OFFER BASF DISKS
Super savings—high quality at low prices. BASF Qualimetric 5¼" SS/DD, $18.00/bx of 10. BASF Qualimetric 5¼" DS/DD; $24.00/bx of 10. All qualimetrics carry lifetime warranty. Shipped UPS COD. Send check (allow for clearance), M.O. or call in Visa/MC. Minimum order 2 boxes.
Denko Sales Corp.
7925 N.W. 12th St., Suite 225
Miami, Fl 33126
(305) 594-4940

DISK Doubler KII
Double your present media storage capacity and SAVE 50% on future disk purchases. Converts FLOPPY DISK to FLIPPY in less than 1 minule. Kit comes complete with EASY TO FOLLOW INSTRUCTIONS. Use with any 5.25 single side disk. Pays for itself! SAME DAY! #ETCOD ONLY $19.95 ea. $2.00 S&H. M/C, VISA, MO, COD (+ $1.85), CHECK.
MAGNETICS, INC., PO Box 98,
South Grafton, MA 01560
1-(800) 334-DISK (617) 839-4404

DMNI INTELLIGENT DISK
NOW, a flexible disk that warns you of impending failures BEFORE they happen! Patented data protection sensors warn of EXCESS HEAT & HUMIDITY. Disks certified at 65% CLIPPING LEVELS. The HIGHEST in the industry. #IN5121 SS/DD-box/10-$39.90. #IN5221 DS/DD-box/10-$49.90. $2.00 S&H.
M/C, VISA, MO, COD (+1.85), CHECK
MAGNETICS, INC.
P.O. Box 98
SO. GRAFTON, MA 01560
1-800-334-DISK (617) 839-4404

3M SCOTCH DISKS $18.50
SS/DD 5.25" $18.50 DS/DD 5.25" $25.50. Ultra-magnetic bulk SS/DD $23.50/20 DS/DD $39.98/20 Supercalc 2 $125 less $15 rebate. Ribbons—C.Itoh/NEC 8023 $4.29 Epson MX70/80 $3.85. Flip-file storage 75 capacity $15.75. File Box 10 capacity $1.49. Labels $12.50/5M. Satisfaction guaranteed since 1977. CA res. add 6.5%.
ARGONAUT DISTRIBUTING
1104 Buchanan Rd.
Antioch, CA 94509
(415) 778-2595

DISCDUNT DISKETTES
Dysan DS/DD $23/10, $74/20, $340/100, Brown DS/DD $26/10, $50/20, $225/100. Buy 20 @ 100 price until Oct. 1st. Shipping (Cont. US) $2.00 1st 10 + .50 each additional 10—$1.50 credit on long distance phone orders. VISA/MC, COD (add $2.00 per order) til. Res. add 8% tax. Write for price list.
SCAMP Systems, Inc.
Box 59451
Chicago, Illinois 60659
Phone # (312) 267-9858

HARDWARE PERIPHERALS

GRAPHICS ON YOUR DIABLO
The only complete printer buffer family! Print and compute at the same time. Buffers from 8K to 64K Bytes for either parallel or serial printers. Graphics models convert 1-2-3 and MBA graphics output into high quality dot graphics on letter quality printers. Units upgradeable to larger buffers and graphics. Proprietary double-buffering. Switch selectable hardware/software protocol. Cables and power supply included. Unique case mounts to side of PC without tools. Priced from $229.

ConvertaBuffer™

VonLeivendyke Enterprises
Silvermine Avenue,
Norwalk, CT 06850 (203) 846-4973

BAR CODE READER SUBSYSTEM
Consists of Bar Code wand, Decoder unit, cable to connect to Async port on IBM PC/XT or other compatibles, and interactive SW pack & Doc. Unit reads high, med., low density Bar Codes. Code 39, UPC, EAN, 2 of 5, 12 of 5, Codabar, Ames, Code 11, others. Various Baud rates. $895. Dealer pricing available.
DATAFLOW TECHNOLOGIES, INC.
8422 Bellona La., Suite 303
Towson, MD 21204
(301) 296-2632/666-2366

HARDWARE STORAGE DEVICES

SRI WINCHESTER SUBSYSTEMS
Internal 10 MB hard disk for IBM PC. WESTERN DIGITAL controller. Tested & formatted, complete kit $1050. No change in BIOS, boot from hard disk. Simple to install like a floppy, DOS 2.0. Several installed, 1 year factory warranty. Additional 10 MB hard disk $750. Tape back-up & removable HD systems available.
SRI DATA SYSTEMS
9 East Pleasant Avenue
Maywood, NJ 07607
(201) 684-4518

MAILING LISTS

IBM PC MAILING LIST
A plethora* of sales leads ... all IBM PC users. Cheshire or pressure sensitive labels. Zip code sort. $90 per 1000. Also post card packs.
*plethora: more than 100,000.
FOOTHILL MARKETING
PO box 595
Tujunga, CA 91042
(213) 352-7543

IBM MAILING LISTS
Over 100,000 names of IBM personal computer owners (counts increase daily) available for rental on labels or magnetic tape. Total 550,000 including other brands.
IRV BRECHNER
TARGETED MARKETING, INC.
Box 5125
Ridgewood, NJ 07451
(201) 445-7196

PUBLICATIONS CATALOGS

PC BUYERS GUIDE
THE INDEPENDENT GUIDE TO PRODUCTS AND SERVICES FOR IBM Personal Computers. This master directory lists, describes, rates for ease of use, and tells you about the latest in software, hardware, accessories, supplies, books, services, et al. Everything for you and your IBM PC. It even includes an index of Computer Camps for both adults and children. From the publishers of PC. An ideal gift at only $7.95 (+ $1.00 shipping/handling) to U.S. destinations, and $10.00 (+ $3.00 s/h), elsewhere. Residents of CA, CO, CT, DC, FL, IL, MA, MD, NJ, NY, and VT, add applicable sales tax. Checks or MasterCard or VISA acceptable (with number, expiration date and signature). U.S. funds only. Mail to:
PC BUYERS GUIDE
P.O. Box 555
Morris Plains, NJ 07950

MIS COMPANY CATALOGUE
PC—DOS, MS—DOS and CP/M—86 software for the corporate community. Complete descriptions and requirements for over 300 business packages. Find out what software Fortune companies buy. Remit $5 for 52 page catalogue and information on corporate sales plan. We sell and support only quality software.
MANAGEMENT INFORMATION SOFTWARE COMPANY
475 Park Avenue South, 34th Floor
New York, NY 10016
(212) 686-0800

RETAILERS

HAWAII

COMPUTERLAND OF HAWAII
IBM PC and a full line of peripherals, software, and books. IBM authorized in-store and on-site service. Maintenance contracts and classes available. Call us for details.
Stadium Mall (808) 487-0030
Kawaiahao Plaza (808) 521-8002
46-208 Kahuhipa St. (808) 247-8541
Kaahumanu Center, Maui (808) 871-9566

SECURITY

PASSWORD CONTROL YOUR PC's
PC LOCK II allows file by file password and encryption protection. With the lock in place, your computer will not boot without entering a correct PW. Ideal for small multi-user environments. XT FORMAT wipeout protection. A 5" × 4" card with diskette, 38 changeable passwords. KEEP YOUR PC STRICTLY PERSONAL.

PC Lock II™

MPPI, LTD.
2200 Lehigh Rd.
Glenview, IL 60025
(312) 998-8401

ELECTRONIC PC ALARM
New hardware security system permits movement of components but will sound an alarm when tampered with. System protects four items for less than $200. Call or write for additional information. Dealer inquiries invited.
SE-KURE CONTROLS INC.
5685 North Lincoln Ave.
Chicago, IL 60659
(312) 728-2435

DATA PADLOCK
DATA PADLOCK is a software implementation of the National Bureau of Standard Data Encryption Standard. Written in Asembler, DATA PADLOCK offers max speed with no increase in file size. An 8 character password provides the key for encryption. Protect sensitive data, text or program files from unauthorized access. Works with all DOS versions. $150. VISA/MC.
GLENCO ENGINEERING
3920 Ridge Ave.
Arlington Hts., IL 6004
(312) 392-2492

SOFTWARE ACCOUNTING

ACCOUNTANTS SOFTWARE
Finally! A software source for the practicing accountant with programs designed especially for the professional practitioner. Tax Planner, Depreciation, After-The-Fact Payroll, Form #1099 Generator, Account Analysis and Client Information System are just a few of many. Call or send for our complete catalog.
OMNI SOFTWARE SYSTEMS, INC.
146 North Broad Street
Griffith, IN 46319
(219) 924-3522

ARCHITECTS AND ENGINEERS

AEMAS System is designed specifically for architects, civil engineers & other professional firms where monitoring project costs is required. Modules available are job costing, payroll, A/R, A/P, general ledger & automatic invoicing. Interactive modules stand alone or run in any combination. Contact Bill Fraedrich.
DATA-BASICS, INC.
11000 Cedar Rd. #110
Cleveland, OH 44106
(216) 721-3400

MABS

(MABS) Merchant's Automated Business Systems. A menu driven accounting Software System for IBM and compatible Microcomputers. Features: Order Entry—$199.95; Invoicing—$99.95; Accounts Receivable—$99.95; Inventory Control—$99.95; Sales Analysis—$99.95; Mailing—$99.95; Bookkeeping—$199.95; To order call or write;
C.A. Richards, Inc./The Intern'l Computer Shop
218-81 Hempstead Avenue
Queens Village, NY 11429
Tel. (212) 776-5264/(212) 706-0452

DJBA PAYROLL CONTROL

Now even the most complex payroll is simple with this easy-to-use menu-driven program. Calculates all taxes and supports multiple wage rates or salaries and user-defined deductions. Prints checks, W2's, reports (current period, YTD summary, etc.) in order by name, employee #, SSn, or zip. Extensive error protection, foolproof data entry, password. Tax updates, minor customizing and full phone support included. Compilable. $300 complete.
D.J. BAILEY ASSOCIATES
3438 West 83rd Place
Chicago, IL 60652
(312) 434-6658

AMI RESTAURANT ACCT. SYSTEM

A system for restaurant and club management featuring daily purchases journal, average cost variance report, daily req. register, req. recap by item and dept, over and short comparison reports, month to date distribution, item cost, item usage analysis, item class, and prints physical inventory worksheets. System accounts for TEFRA and tip accounting. FUTA, SUTA reporting, prints W-2's, 941-A's, and QTD/YTD reports. Includes rest. inventory. G/L, A/R, A/P, and Payroll. List Price: $3,095. Req. 128K, two 320K disk drive or hard disk, PC-DOS 2.0, Monitor and Printer.
AUTOMATION MANAGEMENT, INC.
5718 Westheimer, Suite 410
Houston, TX 77057
Toll Free 1-(800) 231-0634
In Texas, (713) 781-5941

AMI PUBLIC ACCT. SYSTEM

A system featuring a 17 digit chart of accounts, tailorable financial statements, after-the-fact payroll reporting, cost center detail reports, and processing of Prior Period Adjusting Entries, employee time analysis, client services and work in process reports on a current period and YTD basis. System includes T/A, client write-up, A/R, A/P and payroll. List $2995. Req 128K, two 320K disk drive or hard disk, PC-Dos 2.0, Monitor and Printer.
AUTOMATION MANAGEMENT INC.
5718 Westheimer, Suite 410
Houston, TX 77057 Toll free: 1(800) 231-0634
In Texas (713) 781-5941

INTERACTIVE BUSINESS SYSTEM

Integrated software package includes A/R with Order Entry/Commissions & Point-Of-Sale, A/P, Inventory Control/Bill of Material & PO, auto calculating payroll & G/L with Fixed Assets. 53 detailed reports, audit trails & automatic posting from all modules. Floppy or hard drive. Free brochure. Demo & Manual $25.

PERFORMANCE ENGINEERED PROGRAMMING
3970 Syme Drive
Carlsbad, CA 92008
(619) 434-6023

PRACTICING ACCOUNTANTS

Ten of the top 12 CPA firms use Accountants Microsystems, Inc. Software for Professionals. DATAWRITE™ client write-up allows custom reports, packs mainframe power onto your micro. Expand your practice with Fixed Asset Management, Post Facto Payroll, Practice Management and the TAX MACHINE.™ Nationwide Training/Support.

ACCOUNTANTS MICROSYSTEMS, INC.
3633-136th Place SE
Bellevue, WA 98006
(800) 426-8201, (206) 643-2050

CUSTOM PAYROLL

All systems support multiple pay categories, calculation of all taxes, user-defined deductions, exceptional item handling, a variety of necessary reports, paychecks and W-2 forms. Written in PC Basic with full source included for easy maintenance. Prices start at $400.00 for basic system and manual.
DATASMITH, INC.
Box 8036
Shawnee Mission, KS 66208
Phone: (913) 381-9118

DON'T REINVENT THE WHEEL

Now there is a "Clearing House," for microcomputer software at reasonable prices. LOTUS models & unique software is our specialty. Name brand Software is also available well below list prices. Call for our FREE catalog. • Client write-up • Real Estate • Lotus models • Tax • Budget • Fixed Assets • Time & Billing
ACCOUNTANTS MICRO-COMPUTER PRODUCTS
PO Box 248
Frederick, MO 21701
(800) 638-0002 (301) 695-7671 in MD

SOFTWARE

BUSINESS

TIME ACCOUNTING & BILLING

TABS is designed for use by professionals who bill on the basis of time (attorneys, accountants, etc.). User-friendly data entry and menu-driven program selection makes TABS easy to understand and operate. STI's full-feature software is currently in use by over 800 firms nationwide. For details contact:

SOFTWARE TECHNOLOGY, INC.
620 No. 48th, Suite 120
Lincoln, NE 68504
(402) 466-1997

THE SALES MANAGER™

THE SALES MANAGER™ is a professional management information tool for executives in sales, marketing and general business. The system is integrated and handles the tracking and reporting for Customers, Prospects, Sales Representatives, Quota, Commissions, Planning, Forecasting Expenses, Sales Analysis and Personnel. The system easily handles periodic reporting. Importing and Exporting of Files, Linked Records and Multi-leveled Security. THE SALES MANAGER™ is designed to increase sales revenue by allowing the executive control of vital sales information. THE SALES MANAGER™ is easy to use, well documented, flexible, powerful and complete. Price: $575
MARKET POWER, INC.
1780 Rough and Ready Road
Rough & Ready, CA 95975
(916) 432-1200

TIME ACCOUNTANT

TIME ACCOUNTANT is an essential time-keeping and management tool for professionals. Functions include billing preview, invoicing and reporting by professional, client, project and activity. Specially formatted pocket calendar—time sheets supplied. Requires 128K RAM, 2 double sided drives or Winchester. Telephone support. 30 day return. $495.
Time Accountant
636 Waverly St.
Palo Alto, CA 94301
(415) 328-7877.

THE AHA EXPERIENCE

PMS-11, Primavera, shed-spread, Harvard Project Management and Schedules Systems. For managing any complex project—R&D, construction, business planning. 200-10,000 events on critical path, bar charts, resource management—capacity planning & load levelling. Training also. Profits on the critical path with Aha!—the project management software specialist.
AHA, INC.
109 S. River St./PO Box 8405
Santa Cruz, CA 95061-8405
(408) 458-9119

MYTE MYKE™ BUSINESS SYST

COMMERCIAL GRADE INTEGRATED PKG:
• BUSINESS PACK, o/e, p/o, a/r, s/a, a/p, g/l, i/c
• MFG CTRL. Std cost, bom, oper rtg, fcst-sched, mpp, mrp, sfc, where used, inventory control, production costing.
• PROTIME. time and billing
Install and sup. avail. CP/M, PC DOS, MS DOS, UNIX & more.

MYTE MYKE. POWERFUL MICROCOMPUTER SOFTWARE

MDS Associates, INC.
P.O. Box 108
Orchard Park, NY 14127
(716) 662-6621

LP88—LINEAR PROGRAMMING

A GENERAL-PURPOSE system for solving linear programs with up to 255 constraints and 2255 variables. Features include menu-driven input/output, display editing, double-precision arithmetic, primal and dual solutions, sensitivity analysis, storage problems and bases re-start from a given basis, report generator. Required 128K, 1 disk drive, printer DOS. Recommended 192K, hard or electronic disk. Price: $88 for LP88 and user's guide.
EASTERN SOFTWARE PRODUCTS, INC.
P.O. Box 15328
Alexandria, VA 22309
(703) 360-6942

MILP88-MIXED INTEGER LP

A GENERAL-PURPOSE system for solving mixed integer linear programs with up to 45 integers, 255 constraints and 1255 variables. Solves problems by applying the branch and bound method. Menu-driven with many useful features simar to LP88. Requires 192K, 1 disc-drive, printer, DOS. $88
EASTERN SOFTWARE PRODUCTS, INC.
PO BOX 15328
Alexandria, VA 22309
(703) 360-6942

dINVOICER + PLUS

Menu-driven billing & accounts receivable management system. Produces Invoices, Aged Statements, Invoice Journals, Receipts Journals, Aged Customer Account Status, Packing lists, etc. Available with modifiable source code for dBASE II users $129, or as a stand-alone Run-Time™ package $199. VISA/MC.
DATAMAR SYSTEMS
819 Gage Dr.
San Diego, CA 92106
(619) 223-0444

TIME KEEPER (calendar)

A Calendar/scheduler featuring a weekly or monthly graphic display; multiple calendars, conference locating, copy or move appts. within or between calendars, search, tickler reminder, print selected appts., on—line help, user configuration files, plus much more. 192K PC-DOS 2.0 any printer. $195
DuraSoft
7210 Washington Ave.
New Orleans, LA 70125
(504) 486-6081

CALENDAR—SAVES TIME

FAST, graphic, effective time management. View year, month, week or day. Edit, copy, insert, delete, search and print time related information. Maintain multiple calendars on a single diskette. Store/repeat commands. Help. Requires PC-DOS 2.0, 128K, Mono or color. Send $85 (check or M.O.) for "KGcalendar."
KGourley Enterprises Inc.
Dept. MA1
PO Box 180760
Austin, TX 78718

USER CUSTOMIZED SOFTWARE

Complete system for setting up and running user applications to track administrative transactions. Includes file maintenance, input transactions with multiple file updates, scanning and editing, printed forms and reports. TRACKER II System $250. Optional TRACKPAC™ Application Kits $65. $3 shipping.

TRACKER II™ SYSTEM

ANALEX COMPUTING, INC.
5222 Richmond Road
Cleveland, OH 44146
1(800) 336-2966

POWERFUL BUSINESS SOFTWARE

Integrated Order Entry, Invoicing, Inventory Control, Accounts Receivable, Sales Analysis Pkg on most MS DOS Compatibles. Incl. history and forecasting graphics, multi-selective Mailing List module, Call Planning and Commission Statements. $695. Complete Demo package sample data $50. Refundable or applicable toward purchase.

DISTRIBUTED COMPUTING SYSTEMS

DISTRIBUTED COMPUTING SYSTEMS
Martha and Randolph Sts., P.O. Box 185
Lombard, IL 60148
(312) 495-0121

SAVE $ ON TELEPHONE COSTS

Increase office efficiency with PHONECHECK. The Telephone Manager for the IBM PC, XT and PCjr. Generates summary and detail reports necessary to allocate phone costs to departments, extensions, or to clients for bill back purposes. Discourages phone abuse. Helps determine need for WATS or SPRINT. $279.
PHONECHECK, THE TELEPHONE MANAGER
X10X CORPORATION (415) 571-7911
411 Boral Avenue, Suite 425
San Mateo, CA 94402

LIONHEART

Business and statistical book/software packages. Explanatory books, professional compiled programs. EXPERIMENTAL STATISTICS ($75). FORECASTING & TIME-SERIES ($75). BUSINESS & ECONOMIC FORECASTING ($95). BUSINESS & FINANCE MATH ($32). Of real use at work and at home. Free catalog. VISA, MasterCard, check.
LIONHEART PRESS, INC.,
P.O. Box 379
Alburg, VT 05440
(514) 933-4918

CALENDAR PLUS

A time management system that displays activities in block calendar, prints calendar for selected range of activities, times, personnel or locations; prints calendar extracts in tabular lists; merges separately maintained calendars. Much more. PC-DOS/MS-DOS versions. 128K, any printer. $300.00.
International Software Solutions
3355 Lenox Road, Suite 750
Atlanta, GA 30326
(404) 233-1519

INVESTWARE™

A portfolio management system that offers the investment manager comprehensive transaction processing, extensive record keeping, detailed reporting and systematic file editing and updating. A user can accumulate, prepare and present portfolio information. Investment managers $1995 Singler User $595, both w/comm.
NEMS
345 Whitney Avenue
New Haven, CT 06511
(203) 787-3452

P.B.M.S.™

- PEOPLE BASE MANAGEMENT SYSTEM™
- Exceptional "people-oriented" management tool used by: professionals, marketing managers, agents, clubs, associations, charities.
- Evaluate data on donors, members, customers, prospects, clients or any group of people
- Exclusive database program can store, select, sort, retrieve, and print information using 32 descriptive fields per person.
- Transaction function can track dollar amounts and dates in additional fields.
- Built-in word processing and merge will print: lists, labels, envelopes, letters, renewals, notices, appeals, receipts and more.
- WordStar™ and MailMerge™ compatible.
- Flexibility and sophistication unmatched in 100% menu-driven stream lined program.
- No programming required.
- List price $475. See your dealer now or call US Inquiries.

MEDIMATICS SYSTEMS LIMITED
130 Malcom Road
Guelph, Ontario Canada N1K1B1
(519) 836-9201

SOFTWARE
BUSINESS PROJECT MANAGEMENT

PRIMAVERA PROJECT PLANNER™

Critical path analysis for managers and planners. Offers interactive control of project activities, schedules, costs and resources—up to 10,000 activities in any work breakdown structure. Tabular and graphic reporting consistent with DOD standards; supports earned value analysis. Call or write for brochure.
PRIMAVERA SYSTEMS, INC.
29 Bala Ave., Suite 224
Bala Cynwyd, PA 19004
(215) 667-8600

MicroGANTT

Control your project! You describe the work, MicroGANTT calculates the schedule and budget. Time management, resource allocation, project tracking, personnel billing and fixed cost capabilities. Flexible critical path charts. Unlimited size and scope. PC—DOS, MS—DOS, CP/M—80. Free brochure. Demo available.
EARTH DATA CORPORATION
P.O. Box 13168
Richmond, VA 23225
(804) 231-0300

SOFTWARE
COMMUNICATIONS

TELEX LINK SOFTWARE

Link your computer to Western Union telex service via TWX or EasyLink. Cawthon's telex software is specially designed for telex communications and is easy to use, has on-line help, self-test diagnostics, frequently called numbers, and an excellent User's Guide. Cawthon's telex software is available for the IBM-PC and many other computers.

Cawthon Scientific Group

CAWTHON SCIENTIFIC GROUP
24224 Michigan Avenue
Dearborn, Michigan 48124
(313) 565-4000 Telex: 810-221-1265

1-2-3 & VISICALC LOADER

LOADCALC converts text data downloaded from mainframes directly into 1-2-3 or VisiCalc. Handles mixed text and values without special formatting or programming. Now you can move your mainframe database into 1-2-3 or VisiCalc & DBase-II using just LoadCalc and your terminal program. $95.
MICRO DECISION SYSTEMS
Box 1392
Pittsburgh, PA 15219
(412) 276-2387

EASY TO LEARN & USE—$95

Ideal for accessing public databases . . . DIRECT. CONNECT was designed for those with little or no communications experience. Help is accessible from anywhere in the program. Manual written as Tutorial w/Quick Reference section for veterans. Xmodem protocol guarantees accurate data transfer. IBM PC. $95.

direct-aid

DIRECT AID, INC.
PO Box 4420
Boulder, CO 80306
(303) 442-8080

SOFTWARE
COMPILER

OPTIMIZING C86

C86 offers: highest UNIX compatibility "portable", as fast as any of our 22 competitors, full K&R with extras "save time", fast 8087, MSLink "integrate with MASM", library source "learn, do it your way", reliable, great text support, the most 3rd party libraries. $395.00. Call for details.
COMPUTER INNOVATIONS
980-PB Shrewsbury Street
Tinton Falls, NJ 07724
1-(800) 922-0169

LATTICE C COMPILER

Now you can buy the finest 8086/8088 C compiler from the people who wrote it. Latest release supports 1 Mbyte addressing and PC-DOS Version 2. Single-unit price is $500. VISA/MC accepted. Call for quantity discounts, corporate licenses, and information about other compilers and cross-compilers.
LATTICE, INC.
P.O. Box 3072
Glen Ellyn, IL 60138
(312) 858-7950, TWX 910-291-2190

DeSmet C-$109

Full K & R C Compiler, assembler, linker, librarian, full-screen editor and example software. Both 8087 and floating point libraries. Rated 1st or 2nd in 8/83 BYTE Benchmarks. Newsletter. No royalties on generated code. Unlimited updates $20/each. PC/MS DOS and CP/M-86. $109. Now available with source level debugger. Price $159.
C-WARE
1607 New Brunswick Ave.
Sunnyvale CA 94087
(408) 736-6905

SOFTWARE DATA MANAGEMENT

PC-FILE III
The best database program is also the cheapest! Sort, select, search on any field (generic or soundex), incryption, populated fields, "smart" keys, subtotals, totals, export/import to 1-2-3, Mail-Merge, DIF, etc. Print records or mailing labels $45 check, M/C or Visa
ButtonWare
PO Box 5786
Bellevue, WA 98006
(206) 746-4296

BEAST DATA MANAGER
Define your system! Format screens the way you want them! Put your 3×5 index cards onto your PC or PCjr. The BEAST can do all this, plus give you full relational retreval to produce reports, or files to interface with the mail merge function of your word processing software. $65. DOS 96K. Sample $5
STANTON SOFTWARE
PO Box 173
Stanton, NJ 08885
(201) 236-6842

MASTER MANAGER
User may tailor to any profession as a tool to organize, plan work, retrieve information. Set up your information/data files, types of work. Prepare assignment memos with time budgets and your preset completion dates, daily to-do lists, other reports you design. Step-by-step manual. Menu-driven. 64K. Write for more information. $185.
MC/VISA.
MANAGEMENT SOFTWARE, INC.
Suite 316
8716½ L Street
Omaha, NE 68127

APL DATA BASE UTILITIES
DOSFILE APL data base utilities directly access DOS random files (including DBASE). Users can create own APL-file based system and easily integrate own functions into DOSFILE. GP gives random storage of functions and variables. Requires STSC APL; $99-DOSFILE, $30-GP; add $5 s&h, CA res. add 6.5%
Enigma Research/John Uchida
4534 Vista Del Monte, #104
Sherman Oaks, CA 91403
(818) 990-8631

FORM MANAGER
COMBINES data entry, data base forms processing, and spreadsheets. Design forms on screen. Use them for data entry retreval & calculations. Does data entry validation. Report writer sorts any 3 fields. Prints labels, reports, based on your own criteria. Handles up to 32,767 records, $195. Demo disk-$15.00.
BIT SOFTWARE
PO Box 619
Milpitas, CA 95035
(408) 262-1054

SOFTWARE DEVELOPMENT TOOLS

CROSS-ASSEMBLERS
Use your desktop computer as a development system with Avocet assemblers—the industry standard since 1980. Available for CP/M-80, CP/M-86, and PCDOS/MSDOS host systems, in most popular disk formats. Target chip families 6805, 6809, 1802/05, 8048, 8051, 6502, 6800, NEC7500, F8, Z8, COP400, 8085, Z80. $200 to $500

AVOCET SYSTEMS, INC.
804-P South State St.
Dover, DE 19901
(800) 448-8500, (302) 734-0151

PASCAL AND C TOOLS
TOOLS includes full string use, screen handling, graphics, & a general BIOS gate. TOOLS2 supports all DOS 2.0 functions, including program chaining. VIEW MANAGER screens are painted with a Screen Painter & stored in the Screen Database. Source code is provided. TOOLS $125, TOOLS2 $100, VIEW MANAGER $275.
BLAISE COMPUTING, INC.
2034 Blake Street
Berkeley, CA 94704
(415) 540-5441

BASIC TRANSLATOR
Create Libraries of relocatable subprograms, access up to 5 Libraries simultaneously, and $Call modules without line numbering worries. Translator, Linker, Printer Control Facility, and Basic Lib included! Features: Logic mapping, Compression, Code Evaluation, and compiler options. FREE brochure full package $79
PERSONAL SOFTWARE ASSOCIATES, INC.
PO Box 206-PC
Donegal, PA 15628
(412) 423-3200

CROSS ASSEMBLERS
The same manufacturer—compatible, relocatable cross—assemblers Microtec has been providing to professional developers since 1974 are available to transform your PC/MS-DOS host microcomputer into a development system. Loaders/communication utilities included. Target families: 80186, 8096, 8085, 8051, 8048, 68000, 6809, 6800, Z80, 6500, others

MICROTECH RESEARCH, INC.
PO Box 60337
Sunnyvale, CA 94088
(408) 733-2919

P P E TOOLS
Professional Programming Environment for the BASIC programmer. Structured language eliminating line #'s. Conditional macros, labeled procedures, multi-line conditionals. Reduced source file overhead. SLP Structured Language Processor—$35.00. MLP Macro/Library Processor—$20.00. ($3.00 shipping).
BENDORF ASSOCIATES
P.O. Box 5910
Roswell, NM 88201
(505) 347-5701

BASIC COMPILER POWER KIT
Give your compiled BASIC the DOS 2.0 functions interpretive BASIC has with the BASIC COMPILER POWER KIT. Over 20 subroutines let you remove, change subdirectories, search the directory, get FAT information, do string shifts & block moves, & much more. ALL in BASIC. A utility to strip line numbers from source code also included. Make the most of BASIC. $95 VISA/MC.
IMRS INC
111 High Ridge Road
Stamford, CT 06905
(203) 359-9655

SOFTWARE EDIT

KEDIT
KEDIT is an XEDIT-like full screen editor for the PC. Features include split-screen editing of multiple files, targets, ARBCHAR, SCHANGE, GETFILE, SORT, paragraph reformatting, wordwrap, block operations, & key redefinition. Needs 80 column display. 128K (160K with DOS2). $95 plus $3 shipping. Demo version $10
MANSFIELD SOFTWARE GROUP
PO Box 532
Storrs, CT 06268
(203) 429-8402

SUPER SCREEN EDITOR ($SE)
A full featured screen editor including file encription, split-screens, 4 way scrolling, user defined macro's exchange or insert, copy/more/delete blocks of data, optional auto line numbering, search/replace/undo, file backup, print utility, help screens, much more. $99 plus $5 shipping
Binary Corporation
4091 126 Drive North
Royal Palm Beach, Florida 33411
(305) 798-3100

SOFTWARE EDUCATIONAL

Lessonware
No nonsense, written by NY CERTIFIED TEACHERS
Lesson Control Program
(Must buy LCP once) $35
Rhyming, Grade K-2 Arlene Skaglia $15
Spelling, Grade 3-6 Anne Petraglia $20
Cloze Reading, Grade 4-6 Alan Van Cott $15
Infant Ailments, Adult
Leo Di Cara, MO $15
Send check or Visa/MC number and exp. date

THE SOFTWARE FUTURE, INC.
PO Box 60
Holbrook, NY 11741
(516) 472-1778

JENI-MATH: GRADES 1-3
Personalized package using info about your child in games, puzzles, demos and drill exercises on + − × −. Written by PhD math prof for his own kids. JENI-MATH stores past performance and picks problems to maximize learning. Easy to use graphics package reqs: 64K, OD, color graph. $30. Send for order form
JR. SOFTWARE
P.O. Box 2848
Denton, TX 76202
(817) 383-1248

SOFTWARE ENGINEERING

TECHNICAL SOFTWARE
Largest selection of engineering software—CAD, Heat & Mass Flow, structural, Statistical Analysis and much more. Microcomputer programs for Mechanical, Chemical, Civil, Electrical Engineers, Architects, Scientists, Contractors. Send for detailed catalog—Include $2.00 for postage and handling.
TECHNICAL SOFTWARE INC.
3981 Lancaster Rd., #110
Cleveland, OH 44121

ENGINEERING PROGRAMS
PSI is the foremost producer of serious engineering applications for the PC. PAKS available handle chemical, mechanical, civil and power design & analysis problems. Our catalog is growing daily. Call or write for your free copy. See review PC Magazine, Nov 1983, page 567.
PSI/SYSTEMS
Research Park, PO Box 3100
Andover, MA 01810
(617) 475-9030

STATISTICAL QUALITY CONTROL PACKAGE

• XBAR-R charts • P-Charts • C-Charts • U-Charts • Cause and effect diagrams • Histograms • Basic statistics • Frequency distribution • PARETO Charts • Menu-driven • Tutorial • Complete documentation • Sample problems • High resolution graphics and printer output • Also available for Apple • SQC-Pack $385.
CULVERIN CORPORATION
245 West Elmwood Dr
Dayton, OH 45459
(513) 435-2335 or 1 (800) 547-1565

COMPUTER-AIDED DRAFTING

AUTOCAD is 2D drafting and design enabling anyone who draws to create, edit and plot drawings. AUTOCAD is general-purpose and flexible, useful for architectural and engineering drawings of all types which previously required systems costing $100,000. Dealer support includes training disk and manual for only $50.
AUTODESK, INC
150 Shoreline Hwy #B20
Mill Valley, CA 94941
(415) 331-0356

STRUCTURAL DESIGN

Quick, versatile, interactive structural programs—beams, columns & frames of any material efficiently analyzed & designed. Extremely friendly input & output with optional COLOR graphics. Specify PC configuration and send $25 for demonstration disk to.
c^2b^2—software design
763 27th Avenue
San Francisco, CA 94121
(415) 751-1337

smARTWORK™

Printed-circuit artwork editor for double-sided boards up to 10" by 16", runs on an IBM-PC. Color display allows complete interactive control over the placement and routing process. 2X artwork can be made on a dot-matrix printer or pen-and-ink plotter. $895. Write or call for a brochure.

WINTEK

WINTEK Corporation
1801 South Street
Lafayette, IN 4704-2993
(317) 742-8428

OPTISOLVE

Optisolve solves nonlinear systems of equations and maximizes or minimizes nonlinear functions with nonlinear constraints. It has the capability to find all solutions, including complex ones. No programming language is required, the user simply inputs the problem directly in terms of symbolic equations and inequalities. No other package is as powerful. $195.
OPTISOFT
1445 Crone Ave
Anaheim, CA 92802

SOFTWARE FILE MANAGEMENT

KWIC-REF/1

A general purpose text filing system. It is designed to file and cross reference documents, notes, letters and any text materials. It can keep track of up to 32,000 key words and 32,000 documents using "and" "or" and "xor" combinations. $300.
CHEN INFORMATION SYSTEMS, INC.
1499 Bayshore Blvd, Suite 205
Burlingame, CA 94010
(415) 692-4358

SOFTWARE FINANCIAL

ENCORE™ DECISION SUPPORT

ENCORE is the most comprehensive business modeling, analysis, planning, reporting, and graphics decision support system available. ENCORE combines the popular features of an interactive spreadsheet with the extended capabilities of a business planning language, consolidations, goal seeking, formal reporting, financial functions, business graphics and much more. Send for 32 page brochure.
FEROX MICROSYSTEMS
1701 N. Fort Myer Dr./6th Floor
Arlington, VA 22209
(703) 841-0800

COMMERCIAL CREDIT ANALYSIS

CLDS is a tool used by credit analysis and loan officers to help improve the quality of analysis and better quantify the lending risk. It is menu driven and generates common-sized statements, ratios, funds flow, RMA comparisons, projections, trends and graphs. Monthly and Quarterly input formats an dprojections, also available. Basic Model $1,800; Monthly $650; Quarterly $650.
BAKER HILL & COMPANY
9085 E. Mineral Circle, Suite 210
Englewood, CO 80112
(303) 799-0238

CASH FLOW MANAGEMENT

LOOK takes all the what-if power of LOTUS 1-2-3™ and allows the executive to solve problems without programming his computer. It is menu driven and generates common-sized financial statements, ratios, cash flow, trend reports and graphs. Tactical and strategic planning is the focus of LOOK. Dollar and or percentage variables are changed to generate proformas for 5 years or 12 months. $950
BAKER HILL & COMPANY
9085 E. Mineral Circle, Suite 210
Englewood, CO 80112
(303) 799-0238

LAW OF ECONOMIC JUSTICE

A totally new economic concept based on logic and/or mathematics and the existing laws of physics which provides irrefutable solutions to the problems of unemployment, the welfare mess and foreign trade. All color graphics. $100—30 day full refund—if GIGO—or $25 + your evaluation, but no refund.
ROBERT S. VIERRA
2229 Woodside Lane #2
Sacramento, CA 95825
(916) 927-6476

SOFTWARE GAMES

CHECKERS

15 mos R&D & field testing has produced first class checkers game. Easy-to-learn, easy-to-play, yet loaded with menus, 30 skill levels, prompts, features/variations, great graphics! FUN FOR THE WHOLE FAMILY! Children can play, yet challenges adults, even at 10 secs/move! 96K/DOS/color. 10 day money back guar! $35.
GRAMPS: THE CHECKERS CHAMPION
OAKCREST SOFTWARE
P.O. Box 337
Zionsville, IN 46077

BACKGAMMON

Our popular Backgam 1™ lets you challenge the computer to a great game of backgammon whether beginner or advanced. Game allows for several different levels of ability. Improve skills or just have fun. For IBM PC, XT, Compaq or compatible. Send $39.95 Check, MO, VISA/MC or call for dealer near you. Requires 64K, any version DOS, 80 col. monochrome or color disp.
Sears Electronics Inc.
Tirrell Hill
Goffstown, NH 03045
(603) 497-3074

- ChessWright—New for PC!

- Color & monochrome graphics, 7 skill levels
- Descriptive & Algebraic notation, or cursor
- Has large 'book'—Doesn't repeat same game
- All legal moves—Instant move takeback
- Print & review game, save & restore on disk
- Set up games or problems, play either side
- Options: clock, hint, help, & many more
- Needs 64K on DOS 1.1, 128K on 2.0 & later
- By co-author of famous Duchess—$50

SoftWright Systems
P.O. Box 3208
Durham, NC 27705
(919) 383-4441

TRIVIAL COMPUTE!™

Thousands of trivia questions categorized by sports, screen, t.v., history, etc. Up to 6 players. PC DOS. VISA/MC. $24.95
SOFTWARE CONNECTION, INC.
104 So. Washington
Hinsdale, IL 60521

CHESS PARTNER 2.0

This very friendly game offers ten levels of skill, dual clocks, game and problem modes, color graphics, and even allows you to take back prior mistakes! Requires 64K, a disk drive, DOS 1.1 or DOS 2.0 and a color monitor. $24.50. (Includes shipping)
SCOTT MURRAY SOFTWARE
3326 Granada Ave
Santa Clara, CA 95051
(408) 249-6168

SOFTWARE GENERAL

BAR CODE GENERATION SW

Create BAR CODE labels with Old 84, 92, 93. Epson X. Tmog printers. Interactive pack. Prints 39, 93, 12 of 5, 2 of 5, Codabar & UPC-A symbologies on 1-3 up label stock. Inc./Dec. OCR interpretation—meets LOGMARS reqmts. CPM-86, PCDOS—for IBM PC/XT, CDP MPC, other compatibles $300. Dealer pricing available.
DATAFLOW TECHNOLOGIES, INC.
8422 Bellona La., Suite 303
Towson, MD 21204
(301) 296-2632/666-2366

PRINTER BASHER™

Get full menu-based operation of ALL control functions of ALL of the Epson MX, FX and RX printers with the PRINTER BASHER™. Also downloads to the FX the three COMPLETE 255-character IBM sets, including block and line graphics, greek symbols, etc. Scores of different print styles, and a few keystrokes does it all. For the IBM-PC, Apple IIe and Epson QX-10 computers. Visa, MC, COD. $59.95. Free info. Dealers welcome.

PRINTER Basher™

CONNECTICUT SOFTWARE
30 Wilson Avenue
Rowayton, CT 06853
203-838-1844

YOU NEED NEVER MISS

Another important date. The program can be initiated by AUTOEXEC.BAT (or run separately) to search your "custom" calendar and display current items each time the system is booted. The program permits adds, deletes, and changes to the calendar file. MEM—JOG™ is value packed. Req. 1-Disk. $24.95
DAFER ENTERPRISES
P.O. Box 2336
Baltimore, MD 21203
(301) 433-3904

BLUEBOOK

PC. DATEBDDK/CALENDAR

Full featured Personal DATEBOOK, CALENDAR & ADDRESS LIST organizes your hectic family or business schedule. Display & prints monthly calendar with daily events and appointments. Maintains, searches and displays your address list too! Fast and easy to use. Only $29.95. Prompt shipment. VISA, MASTER, check or COD.
LATERAL PROGRAMMING, INCORPORATED
Altamonte Springs
Florida 32701-0337
(305) 788-1433

FSI CALCULATOR $49.95

Get more use from your computer! The FSI CALCULATOR provides a full featured business and scientific calculator on your PC. Develop your own functions (save to disk) and use the 35 built in functions. Eight accumulators, function keys, tape feature and more! Requires DOS, 128K. Shipped UPS. MC, VISA.
FUNCTIONAL SOFTWARE INC.
P.O. Box 237
St. Clair Shores, MI 48080
Order now! (800) 824-7888 Operator 168

PUBLIC DDMAIN SDFTWARE

Our Users Group Library can help you get more from your PC or PCjr! Choose from these software packages:
- NEW PC or PCjr. USER-3-disc starter set. $25.
- PC SIX-PAC-Six discs containing a wide variety of useful software. $49
- SAMPLER-one get-acquainted disk. $10

Send in your order today (please include $2 for shipping & handling). Catalog included.
CENTRAL CALIFORNIA USERS GROUP
P.O. Box 8140
Santa Cruz, CA 95061
(408) 684-1617

DVORAK KEYBOARD SDFTWARE

Want a Dvorak Keyboard for your IBM PC? Sure-Stroke translates keystrokes, gives you Dvorak Typing Coach, transfer letters for key tops, manual, self-motivation audio cassette. Works with Lotus, dBase, WordStar, etc. Stop hunting and pecking—Stroke the Dvorak today! $49.95 plus $3.95 shipping. Visa/MC or check.
SEASONED SYSTEMS, INC.
Box 3036
Chapel Hill, NC 27515
(800) 334-5531 (919) 967-5618

BARGAIN SDFTWARE PACKAGE

An information filer, a complete address book system with many features, a text encoder, a biorhythm calculator, a banner program, several games and much more. For IBM—PC/XT. Requires 1 disk drive, PC—DOS 2.0/2.1. User friendly. Only $29.50 + $1.50 shipping. CT residents please add 7.5% sales tax.
LK SOFTWARE
5 Hooker Lane
Cos Cob, CT 06807
(203) 869-6707

CHURCH ADMINISTRATION

COMPUCHURCH™ Unequaled Excellence At Low Cost. Superb Software For ALL Of Your Church Admin: Congregation Mgt, Contribution Mgt, Ledger & Word Processing. Available For Most Micros—Including IBM PC, DEC Rainbow, Radio Shack III/IV, Tandy 2000, Corona, Sanyo and Zenith. Hardware Available. Dealer Inquiries Invited.
MICROCOMPUTER TECHNOLOGY & SOFTWARE, INC.
312 Government Street—PO Box 596
Niceville, Florida 32578
(904) 678-3328

LARGD SOFT INTERNATIDNAL

ARGOSPACK	—The Industrial/Mechanical engineering pack.
HIGHCAD	—The complete highway + construction CAD system
THERMAX	—The printed circuits board heat transfer CAD system for Milspecs designers
IDP	—The complete 2½ D drafting system
STARNET	—The powerful project Management system
PC-MAPICS	—Systems 34 IBM Mapics compatible

SEE US AT COMDEX—BOOTH #6643
LARGO SOFT INTERNATIONAL
Hameasfim St
Tel Aviv, Israel 64736
03-250918/250919 Telex 35301, Largo, IL

SOFTWARE
GRAPHICS

35mm SLIDE FRDM YDUR PC

COMPUTER SLIDE EXPRESS converts graphic files produced on the IBM PC into brilliant 35mm color slides with color resolution 400% better than your monitor. Leave your printouts behind. Use high resolution color slides at your next presentation. COMPUTER SLIDE EXPRESS $6/slide. $30 minimum order.
VISUAL HORIZONS
180 Metro Park
Rochester, NY 14623
(716) 424-5300

GRAPHWRITER PRESENTATIDN GRAPHICS

Graphwriter™ is specifically designed for your presentation graphics requirements. Chart formats include pie, bar, line, text, scatter, organization, GANTT, "bubble", table and many other special purpose chart formats. With Graphwriter you get the chart you want, the way you want it. Starting at $395.
GRAPHIC COMMUNICATIONS, INC.
200 Fifth Ave.
Waltham, MA 02254
(617) 890-8778

HALO™

Graphics subroutines that run under MS/DOS in PASCAL, C, ASSEMBLER, FORTRAN, BASIC, and APL+. Supports color & monochrome graphics devices & can be graphics interface to applications. Lines, arcs, circles, dithering, patterns, etc. can be created. World coordinates, fonts, image compression & animation features Inc.
MEDIA CYBERNETICS, INC.
36 Columbia Ave.
Takoma Park, MD 20912
(301) 270-2272

GRAPHIC PRINTER SUPPORT

At last IBM-PC graphic character support for your dot matrix printer. Use the PrtSc key to produce quality scaled dot matrix reproductions of your display on your Epson, IBM, Okidata, IDS, Centronics, DEC, Anadex, Datasouth, Gemini, TI 850, Riteman, Toshiba, NEC 8023, or C. Itoh printers. If your printer is not listed, let us know and we will support it. GRAFPLUS is now available for all versions of PC or MS-DOS and will operate with IBM and Hercules graphics boards as well as the IBM monochrome. $49.95.
JEWELL ENERGY TECHNOLOGY
4451-53rd Avenue Southwest
Seattle, Washington 98116
(206) 937-1081, (214) 245-7387

PLOTOGRAPHY™

Now PLOT your graphics drawings on paper or transparency. Great for ovrhd presentations. Make them any size, anywhere on page, either direction. Will PLOT drwngs from most graphic editors. Req: IBM PC, XT or PCjr, 128k, clrbrd, flpy or hrddsk, PC DOS. Only $49.95! Call to see if we support your plotter.
CACTUS SOFTWARE, INC.
PO Box 880
Peoria, AZ 85345

CDLOGRAPHY™

Color graphics editor for IBM PC & XT. Lets you create color images on the screen with ease. Can be used by anyone for Business, Education, Programming, Design & Art. Your next SW update is FREE! Requires IBM PC or XT, 128k, color board, 1 flpy or hrd dsk, PC DOS. Only $99.95! Call or write for more details.
CACTUS SOFTWARE, INC.
PO Box 880
Peoria, AZ 85345
(602) 242-7953

FDRTRAN/PASCAL PEN PLOTS

PLOTMATIC. Complete support for H-P, IBM, Apple and HI pen plotters. All primitives available as subroutine/procedure calls PLUS total 2D plotting support package. Interfaces with GRAFMATIC. Specify compiler (version number) and plotter. $135. Plotmatic from Microcompatibles.
Microcompatibles, Dept. P
11443 Oak Leaf Dr.
Silver Spring, MD 20901
(301) 593-0683

CDMPLETE PRINTER GRAPHICS

Eliminates tedious programming hours when graphs, bar charts, or High-res graphics are desired. Produce full 132 column graphics on your IBM, EPSON, or STAR dot matrix printer. Run as a stand alone package or integrated with other software. YOU WON'T BEAT THE PRICE—$37.50 + $2.50 shipping.
YORKSHIRE SYSTEMS, INC.
16515 Hedgecroft, Suite 320
Houston, Texas 77060
(713) 999-1840

FORTRAN/PASCAL GRAPHICS

70 MicroSoft FORTRAN/PASCAL (3.1, 3.2), IBM (2.0) or SuperSoft FORTRAN callable subroutines. Professional graphics power backed by a 100 page user manual, filled with examples and designed to be useful to every level of user. Five packages in one! General utility, 2-D interactive, 2-D plots, 3-D plots, and solid models (hidden line removal!) $135.00.
MICROCOMPATIBLES
11443 Oak Leaf Drive
Silver Spring, MD 20901
(301) 593-0683

DRAW & MDRE—ONLY $99.95

Need drawings for your write-ups? ARTPAK is an invaluable addition to your word processor. Camera ready art! Many image controls incldng rotate—cut/paste—expand—shade—crosshairs. Mix text. Menus. Fast! Prints 2 sizes. Also has impressive arcade style animation up to 999/disk. 128K/Graphics card. MC/VISA. Call now!
PAL SOFTWARE CORPORATION
PO Box 39961
Los Angeles, CA 90039
(213) 259-9659

SOFTWARE
HOBBIES

ASTRDLOGY SOFTWARE

We have everything from high-accuracy calculation packages for professional astrologers to programs that print multipage natal, forecast, relationship and numerology interpretations for everyone. These interpretation programs include a license to sell the copyrighted text output.
AGS SOFTWARE
BOX 28, Dept. C
Orleans, MA 02653
(617) 255-0510

STAMP CDLLECTORS

The Philatelic Management System is superior software for every level of collector. Covers every aspect of collection management. Inventory Module now available and upgradeable to complete system. IBM PC, Apple IIe and III. Complete system $295, Inventory Module $159. Demo package $15, credited to final purchase.
SOFTSTYLE, INC.
7192 Kalanianaole Hwy., Suite 205
Honolulu, HI 96825
1-(800) 396-6368

BLUEBOOK

SOFTWARE INSURANCE

THE AGENCY MANAGER™
Designed by insurance professionals for independent insurance agents, this integrated system performs: Customer acctg., general ledger, client data update and retrieval, over 100 marketing reports and sales tools, ACORD's Easy main menu and HELP feature. IVANS. IBM-PC, CP/M, Turbodos
APPLIED SYSTEMS
Pauling Rd
Monee, IL 60449
(312) 534-5575

PROPERTY/CASUALTY INSURANCE
Insurance agency automation package. Completely interactive from invoicing to P&L statements. Provides CR, CD, JE month end summaries, daily transaction reports. Basic pkg-$1500. Other options available including on-line customer policy retrieval profile, customer online daily transactions, producer reports, & more. PC-DOS & CP/M
Dimensional Business Systems, Inc.
250 N.W. 4th Diagonal
Boca Raton, FL 33432
(305) 368-0270
199 Bay St. 4th FL
Toronto, Ontario, Canada M5J1L4
(416) 367-9882

SOFTWARE LANGUAGES

FORTH-32
The most complete language available for the PC. Comprehensive 420 page manual. Complete interface to DOS and BIOS, including graphics, video interface, parallel and serial ports, light pen, joy-stick, sound, color, DOS file access. Double screen editor. The only full FORTH 8088 Assembler. See our ad this issue.
QUEST RESEARCH, INC.
303 Williams Ave
Huntsville, AL 35801
(800) 558-8088 or (205) 533-9405

muLISP™—83
An integrated environment for AI software development includes a high performance, pseudocode LISP compiler, a resident, screen oriented editor and debugging system, interactive LISP programming lessons, and a detailed reference manual. $250. Also the muMath Symbolic Math System, $300
THE SOFT WAREHOUSE
P.O. Box 1174
Honolulu, HI 96828-0174

SOFTWARE LEGAL

LAWSEARCH-WESTLAW
Access the WESTLAW legal database using an IBM PC/PC-XT or compatible. Certified and recommended by West Publishing Co. for their WESTLAW subscribers using PCs. Easy to learn & use. Log-on automatically w/one keystroke. Save information to disk or printer. Convert files for use with most wordprocessors. $350

DIRECT AID, INC.
PO Box 4420
Boulder, CO 80306
(303) 442-8080

SOFTWARE MAILING PROGRAM

MY — T — MAILER
This menu-driven mailing program will print labels, 3×5 cards, envelopes, etc. all sizes, all arrangements! Sort on all fields. Powerful commands select labels in any order and up to 5000 copies of one label can be printed. Supports RAM disks and Hard disks. Requires 128K, DOS, parallel printer, 80 col display. $30.
JOHNSON SOFTWARE COMPANY
Suite 195
420 Pier Avenue
Hermosa Beach, CA 90254

INNERVISION'S MAILER
A database of names, addresses, and many other vital statistics make a powerful mailing system for your PC/XT/jr. The program is menu-driven. It prints mailing labels, form letters, telephone directories, and master listings. Functions include full screen editing, 19 way query with ADD & SUBSET, 17 way sorting, dynamic printer control, and printout formatting. Req. 1 dd, 128K, DOS. $60 + $4 shipping
INNERVISION MICROSYSTEMS, INC.
P.O. Box 3427
Silver Spring, MD 20901
(301) 445-2493

SOFTWARE MANUFACTURING

QUALITY CONTROL
QUALITY ALERT™—Diagnose and correct quality problems with ease. Descriptive statistics • Histograms • Control Charts • Process Capability • Variable/Attribute Data Samples • Graphic and Printer Output • User Friendly • Menudriven • Complete Documentation • Support • Apple, IBM PC & XT compatible. Money back guarantee, $795.00
PENTON SOFTWARE, INC.
420 Lexington Ave./Suite 2846
NY, NY 10017
(212) 878-9600, 1-(800) 221-3414

MCBA MANUFACTURING SYSTEM
Adapted for the IBM PC using MS-DOS. Inventory Management, Bill of Materials, Order Processing, Purchasing, Job Costing, MRP, Labor Performance, Shop Floor Control, Standard Product, Costing and Routing, Accounting. Install & support available. In use at over 11,000 installations!!!
MDM Systems, Inc.
5701 Chicago Rd., Suite C
Warren, MI 48092
(313) 979-7030

MYTE MYKE™ MANUFACTURING
CONTROL SYSTEM integrates with BUSINESS SYST & features mainframe capabilities. STD COST ...bill of matl and operations routing provide where used, same as except, & projection capabilities. FORECAST/SCHED, MRP, MPP, Production costing, SHOP FLOOR CTRL. Install & support avail CP/M, PC DOS, MS DOS, UNIX & more

MDS ASSOCIATES, INC.
P.O. Box 108
Orchard Park, NY 14127
(716) 662-6621

TWIN OAKS MRP-II
- Bills/material
- Inv Control
- Purchasing
- MRP & CRP
- Master Sched'g
- Phys inventory
- Std Costing
- 22 Modules
- 128K PC or XT
- DOS 1.1 or 2.0
- Hard/Soft Disk
- Online—Realtime
- Multi User
- Acctg Interface

TWIN OAKS, INC.
8130 East Pt. Douglas Rd.
Cottage Grove, MN 55016
(612) 458-1604

MANUFACTURING INVENTORY
Designed with the small- to medium-sized manufacturing firm in mind, MISys is big enough to handle your needs, yet costs only $995. Integrated Inventory Control, Bills of Material, Purchase Orders. For IBM PC/XT and compatibles. Multi-user versions also available. Dealer inquiries invited
MICROCOMPUTER SPECIALISTS, INC.
18 Lyman Street
Westboro, MA 01581
(617) 366-1200/(800) 833-1500

SOFTWARE MEDICAL

POS/1™ VERSION 4.0
MEDICAL BILLING & A/R. Statements & Ins. forms. Aging & revenue analysis with bar graphs. Multiple doctors, practices, insurances. Day sheets, recall notices, referring physicians, audit trails, ledger details. Online update & access by acct #/name. Customizable procedure & Dx codes, menu-driven, help screens. PC-DOS, 128Kb, hard disk. $2200
CHEN INFORMATION SYSTEMS, INC.
1499 Bayshore Hwy. Suite 205
Burlingame, CA 94010
(415) 692-4358

FREE DEMO DISKETTE!
Turn your computer into a valuable ally in achieving perfect fitness and permanent weight control. Order demo diskette for only $6.00 and deduct this from the purchase price of $69.95 when ordering the Master Control Diet and Exercise Program. PCjr version now available (128k, 80 column monitor).

HEALTHWARE
1504 Leander Rd.
Georgetown, TX 78626
(512) 863-6910

THRESHOLD
Medical system. 120 programs performing paper and electronic claims (to Blue Shield, Medicare/aid), statements, A/R analysis, clinical studies, referring physician reports. Features include: on-line help, full security with audit trails, patient name orientation, $5,500. Requires hard disk, 128K, COBOL run-time. PC-DOS
PHYSICIANS PRACTICE MANAGEMENT, INC.
1810 S. Lynhurst, Ste. O.
Indianapolis, IN 46241
In the continental U.S. call (800) 428-3515 (indiana residents call (800) 792-3525)

AUTOMATED PRESCRIPTIONS
RXWRITER is a sophisticated program that
- Produces legible prescriptions
- Prints up to 20 prescriptions at a time
- is flexible and fast
- Keeps a record on disk of diagnosis and all prescriptions written.
- Is only $100 with 40 page manual

HALL DESIGN, Inc.
250 Maple Avenue
Wilmette, IL 60091

DIFFERENTIAL DIAGNOSIS
The INTERNIST program runs differential diagnoses on any combination of 480 symptoms for 331 diseases. Lists symptoms associated with any disease. Prints and displays diagnoses in rank order. Extremely easy to use and fast. Includes binder, user-manual, program and data base diskettes. 128K RAM required (64K versions available) $95.00. VISA, MC, check, or UPS COD accepted.
N-Squared Computing
5318 Forest Ridge Rd.
Silverton, OR 97381
(503) 873-5906

SOFTWARE/One-of-a-kind

RAM DISK II
RAM DISK II is a 180K RAMDISK and comes with a PRINT SPOOLER runs on IBMPC compatible systems, AND WORKS EXACTLY LIKE ANOTHER DRIVE. Instantaneous loading of programs. NO hardware, NO commands, 100% software! Self-initializes at bootup. Searches ALL boards for memory. Only $59.95 for the Ram Disk & Print Spooler.

RamDisk II with Print Spooler

RENSIN COMMUNICATIONS
PO BOX 414
College Park, Maryland 20740
(202) 728-7955

SOFTWARE
OPERATING SYSTEMS

MULTI-USER XT SOLUTION
With OASIS-16 operating system, run 3 users on an IBM PC XT using all IBM components. Each user may run different programs, or files can be accessed simultaneously by all users with security & data integrity. Share printers. Run proven basis business applications and/or develop your own BASIC programs. $795
PHASE ONE SYSTEMS, INC.
7700 Edgewater Dr., Ste. 830
Oakland, CA 94621
(415) 562-8085, TWX 910-366-7139

MULTIPLE USERS UNDER PC DOS
MultiLink turns PC-DOS into an efficient multi-user multi-tasking operating system. Additional users are supported by attaching inexpensive CRT terminals or modems to serial ports on the PC, and can run normal applications designed for PC-DOS. Includes host communications software for public dial-in.
THE SOFTWARE LINK INCORPORATED
6700 238 Roswell Rd.
Atlanta, GA 30328
(404) 255-1254

TASCMASTER SOFTWARE
Multi-Tasking IBM-PC or IBM-PC-XT. Operating under PC-DOS, allows up to 9 tasks to be run concurrently in background mode unattended. Can work in Wordstar, do a calculation from Lotus 1-2-3, monitor modem, database sort and month-end closing from Accounting Program all at once. Price $475 including Addram Plus or Addram Elite multifunction board.
PROFIT SYSTEMS, INC.
30150 Telegraph Road
Birmingham, MI 48010
(313) 647-5010

SOFTWARE
PREVENTIVE MAINTENANCE

DISKETTE DRIVE ALIGNMENT
READISCOPE is a comprehensive diagnostic program that analyses the status of a diskette drive. Fast, 1 minute checkout. Drives can be tested without removal. Adjustments to head, speed and spindle hub alignment can be made without special tools or skills. Comes complete with special diagnostic disk. $298
ReadiWare Systems, Inc.
P.O. Box 680-N
West Redding, CT 06896
(203) 431-3521

SOFTWARE
REAL ESTATE

PROPERTY MANAGEMENT PLUS
A new easy-to-use system for single or multi-family properties. Prints checks, rent statements and receipts. Reports—late rents, expired leases, vacancies, income/expenses, and operating statements. Includes a bank reconciliation feature and graphics capabilities!! Up to 70% reduction in management time. $525
REALTY SOFTWARE COMPANY
1926 South Pacific Coast Hwy. #229
Redondo Beach, CA 90277
(213) 372-9419

REAL ESTATE TOOLS I
Over 45 powerful, easy-to-use, menu-driven analyses of mortgages (regular, ballon, GPM, constant principal, wrap), leases, construct. Loans and variable/grouped cash flows plus amortizations. Computes IRR, NPV, FMRR, price, points, yield, etc. For IBM PC/XT/compatibles, 128K, 2 DS drives. 228-page manual. $299
ANSONN SOFTWARE INC.
2801 N. Surrey Drive
Carrollton, Texas 75006
(214) 446-4340

SUPER EASY-"REALPAC"
Professional Investment Analysis in minutes, without computer training. Full screen editing. Calculates Incomes, Cash Flows, IRR's & Depreciation, tax sheller and MORE. Prints very easy-to-read reports. Also included are easy, but sophisticated Amort. Sched.'s, IRR & Depr. Calculators. FULL Manual—Price $275.
CREATIVE BUSINESS COMPUTER SYSTEMS, INC.
6731 Red Road
Coral Gables, FL 33143
(305) 666-7970

EZ-RE INVESTOR TEMPLATES
Complete analysis package for the Real Estate Investor. For Equity Share, Rent House, Apartments, Warehouses, and Office Buildings. Five mortgages can be ARM, FHA245, amort, deferred int. or int only. Ten year projection of cash flow, deductions, sell price, tax at sell, gain or loss per year, and after tax IRR. Expenses, int, rent, and appreciation adjust annually. Also 45 year loan amortization template. Prof. report. Requires LOTUS 123 and 256K. $50 PPD. Money back guarantee. Visa, MC.
LB ASSOCIATES, INC.
8817 Skokie Lane
Vienna, VA 22180
(703) 938-9093

REAL ESTATE CONSULTANT
A sophisticated real analysis package is designed to make investment decisions easy. Features Amortization and Depreciation schedules, VIRs, Balloons, and Known Loan Payments. This package handles up to eight mortgages with wraps, syndications, partnerships and individuals, investment tax credits. $275.00. Dealer inquiries welcome.
CONSULTANT SYSTEMS, INC.
3704 State Street Suite 311
SANTA BARBARA, CA 93105
(805) 682-9827

SOFTWARE
SECURITY

PUBLIC KEY ENCRYPTION
The ultimate security for your data, on disk or during transmission. Datamorphics' Public Key Encryption system permits you to choose your level of security, eliminates the key security problems of point to point encryption schemes. Ideal for business to business or business to government communication. List Price $199.00 (Canada $249.00)
DATAMORPHICS LTD.
P.O. Box 820, Stittsville,
Ontario, Canada K0A 3G0
(613) 836-3270

BIT-LOCK® SECURITY
Guard your valuable software from PIRACY. Our inexpensive security system protects you from lost profits. Copies will only operate with a BIT-LOCK device attached. BIT-LOCK's powerful multi-layered security has proven its effectiveness on IBM PC/XT, TRS-80, Apple and commodore computers thru the test of time.
MICROCOMPUTER APPLICATIONS
7805 So. Windermere Circle
Littleton, CO 80120
(303) 922-6410

IBM PC DATA ENCRYPTION
PROTECT your confidential W.P.—Spreadsheet—Database—Communication— Source Code—Basic—EXE & COM files FAST—500 BILLION Passwords! New PC-DOS 1.1/2.0/2.1 program—A must for PC & XT systems. EASY TO USE! Help built in! Copyable! Affordable security—$39.95 ppd. Free info—Mail Check/M.O. to:
O.A. RITARI & ASSOCIATES
P.O. Box 65771
St. Paul, Minnesota 55165

SOFTWARE
SORT

OPT-TECH SORT/MERGE
Extremely fast Sort/Merge program for the IBM-PC. Can sort or merge multiple files containing fixed or variable length records. Run as a DOS command or call as a subroutine, plus many other features. Now also sorts dBASE II files! Compare before you buy any other. Write or call for more info. $99
OPT-TECH DATA PROCESSING
P.O. Box 2167
Humble, TX 77347
(713) 454-7428

PERSONAL COMPUTER SORT
Fast, easy-to-use sort program for your IBM PC. Can sort your text files on multiple fields in either ascending or descending order. Handles fixed or variable length records. Clear concise messages make it easy to understand and operate. $50
ThoughtSoft
PO Box 3112
Cincinnati, OH 45201
(513) 221-7539

INTERNAL SORT FOR BASIC
N_SORT—A FAST and easy to use quicksort subroutine written in C and assembler, CALL able from BASIC. Sorts an unlimited number of records in memory on up to 8 keys of mixed types, ascending/descending. Like having a SORT built into the language. Works with compiled and interpreted BASIC, all DOS versions. $49.95!
NATIONAL SOFTWORKS
65 East Elizabeth Avenue
Bethlehem, PA 18018
(215) 867-4800

SOFTWARE
STATISTICS

SIGSTAT
SIGSTAT includes over 30 programs of the BMD statistical series, plus many advanced new features. Mainframe capacity (up to 80 var.) for uni—(e.g., ANOVA, regression) + multivariate (e.g., canonical, factor) analyses, time-series, crosstab, plots, and much more. 8087 support opt. 128K, DOS, $595
SIGNIFICANT STATISTICS
3336 N. Canyon Road
Provo, UT 84604
(801) 377-4860

BLUEBOOK

THE SURVEY SYSTEM
An easy to use, menu driven system for the entry, editing, processing and presentation of questionnaire data. The system can produce crosstabs and scores in banner formal, statistics and bar charts. Tables and charts are camera-ready for professional presentations. Card readers and open-end coding/analysis options available
CREATIVE RESEARCH SYSTEMS
1864 Larkin Street, #2
San Francisco, CA 94109
(415) 771-0912

NWA STATPAK
Powerful data manipulation utilities, ASCII data structure for interface to databases, word processors, etc. Statistical functions include probability, descriptive statistics, regression and correlation, non-parametrics, distribution functions, means testing, survey data analysis, & ANOVA $495.
NORTHWEST ANALYTICAL, INC
1532 Morrison St
Portland, OR 97205
(503) 224-7727

MSUSTAT
40 procedures—Multiple regression, analysis of variance & covariance, multiple & contrast comparisons, non-parametrics, attribute data analysis, t-test, random data generation. Simplicity, but with features for professionals. A fast compiled FORTRAN ready-to-run package for MS/PC-DOS with 128K & CP/M-80. With 64K ($505).
THE RESEARCH AND DEVELOPMENT INSTITUTE, INC.
Montana State Univ. Attn: R.E. Lund
Bozeman, MT 59717-0002
(406) 994-3271

SOFTWARE STOCK ANALYSIS

STOCK MANAGER
A sophisticated system that offers you an easy & economical way to keep your investment portfolio current. Keeps over 25 items of information on over 400 stocks. Produces several reports including current value of the portfolio. Easy to follow menu. $150. Send or call for our complete catalogue.
OMNI SOFTWARE SYSTEMS, INC.
146 North Broad Street
Griffith, IN 46319
(219) 924-3522

WALL STREET WINDOW
- Integrated stock pkg. with extensive TECHNICAL ANALYSIS-moving avgs., stock comparisons, trendlines, relative strengths & more
- Detail hi-res GRAPHS, avail. in four COLORS using COLORPLUS board
- SPREADSHEET interface for portfolio updating
- AUTOMATIC access to DOW JONES, historical & current quotes
- AUTORUN using saved keystrokes, $395, DEMO-avail.

R&D SOFTWARE ASSOCIATES
PO Box 2727
Reston, VA 22090
(703) 476-6597, 950-1088 (pause) 800-123

BRANDON STOCK SYSTEM
Full feature technical analysis system for PC & compatibles. Use the built-in buy/sell formula or the single keystroke graphing functions. Support hard disk, Tymnet, Telenet, Uninet, Dow Jones (for updating), The Source, Compuserve. Full color, very fast high & medium res. graphics. Requires 128K, 2 DS/DD drives, Hayes compatible modem. Price $325 VISA/MC.
BRANDON INFORMATION MANAGEMENT
615-N 666 W. Germantown Pike
Plymouth Meeting, PA 19462
(215) 828-3249

SOFTWARE TAXES

PARTNERSHIP TAX ANALYSIS
Unique partnership tax planning and analysis program. Save millions for your own or your client's partnership. Program menus allow the evaluation of all planned partnership action for the implication. System gives you alternative and backs each one up with court decisions, rulings, regs and opinions. Stand-alone, Runtime™ $2,495.
STRAG ANALYTICAL SYSTEMS, INC.
P.O. Box 42825 Suite 350
Houston, TX 77242
(800) 835-2246 ext. 99. In Kansas (800) 362-2421 ext. 99

SOFTWARE TERMINAL EMULATION

BURROUGHS HANDSHAKE
AN ALL-SOFTWARE Burroughs MT9 83/TD 830 terminal emulator. HANDSHAKE allows PC or compatible microcomputer to communicate with existing Burroughs host programs. Also transfers files between the host and microcomputer disk storage concurrent with dialogue. Installed worldwide.
SOFTWARE CLEARING HOUSE
771 Neeb Road
Cincinnati, OH 45238
(513) 451-6742 Telex 24-1665

BLUE LYNX
Let your IBM/PC or XT replace your dumb terminals. The BLUE LYNX hardware board with associated software emulates the 5251/12 for the S/34, S/36, & S/38 as well as the 3276 for the larger 43XX and 30XX mainframes, both bi-sync and SDLC versions. TECHLAND specializes in communications. BLUE LYNX is only $690.
TECHLAND SYSTEMS INC.
25 Waterside Plaza
New York, NY 10010
(212) 684-7788

HASP IBM 360/20 EMULATOR
BARR/HASP simultaneously transmits jobs and receives printouts directly IBM's MVS/JES, VM/RSCS bypassing TSO and CMS. Emulates HASP on 360 model 20 and is compatible with all HASP multileaving protocols. Features: Menu-driven operation, multiple printers, 1000 lines per minute, 1200 to 19,200 baud, self-testing, loop-back mode, easy installation, free customer support and more. BARR/HASP is field proven and delivered with a one-year warranty. Total cost of software, synchronous adapter board and documentation-$890. Manual only $14.50. Call for trial evaluation.

2500 Blue Ridge Road/Suite 315/Raleigh, NC 27607

BARR SYSTEMS, INC.
2500 Blue Ridge Road, Suite 315
Raleigh, NC 27607
800-BARR-SYS

SOFTWARE TRAINING

THE AUTHOR® & AUTHOR PLUS
THE AUTHOR® is a flexible, reliable, COMPUTER AUTHORING SYSTEM. Its ease of use, automatic branching, complete record keeping & thorough documentation make it a proven winner. THE AUTHOR PLUS™ combines all of these features with GRAPHICS, expanded use of function keys, and full screen editing & entry.
RAPTOR SYSTEMS, INC.
324 South Main Street
Stillwater, MN 55082
Formerly—PHOENIX PERFORMANCE SYSTEMS
(612) 430-2980

SOFTWARE TYPESETTING

HIGH-TECH TYPESETTING
Our fully automated facility allows us to offer the fastest turnaround time and lowest prices. Transmissions received by 1:00 pm EST are sent out the same day. Cost is a low $2/thousand characters with a $5 minimum per job. Transmit toll free 24 hours/day. 200 typestyles available including "printout." Hyphenation & justification program available for PC—$50. Major credit cards accepted. Call for free brochure. Comprehensive manual available $10.
INTERGRAPHICS, INC.
106 A South Columbus Street
Alexandria, VA 22314
(800) 368-3342, (703) 683-9414 in D.C. area

SOFTWARE UTILITIES

SYMBOLIC DEBUGGING
The Mylstar SO Program enhances the IBM DEBUG Program using the same command structure. Use symbol names, mathematical expressions, Batch Files, on-line help, multi-command macros, and loop structures. Makes your job easier, for PC-DOS 1.1 128K RAM minimum. $125.00 check, money order, MC or VISA.
MYLSTAR ELECTRONICS, INC.
165 West Lake Street
North Lake, IL 60164
(312) 562-7400

FULL CONTROL FROM BASIC!
Cut development time, add speed & power to your programs with NUB. A library of assembly language sub-routines callable from BASIC: execute COM & EXE files, save & restore areas of the screen, clear & scroll windows, much more! Add DOS functions to your menus. Create fast help screens. Unlimited uses. Complete manual & sample programs. All DOS versions. $49.95. Source avail. Call or write.
NATIONAL SOFTWORKS
65 East Elizabeth Ave.
Bethlehem, PA 18018
(215) 867-4800

COPY PROTECTION BY MSO
The ULTIMATE diskette copy protection system designed for software developers and publishers. A variety of protection methods are available to suit your protection requirements. All IBM PC and XT environments are supported which includes DOS, BASIC (compiled and interpretive) Pascal, P-System, dBASE II and stand-alone systems. Customized systems also available. Requires 64K, two disk drives.

MICRO-SOFTWARE DEVELOPERS, INC.
214¼ West Main Street
St. Charles, Illinois 60174
(312) 377-5151

KNOW THY PC!
- THE INSIDE TRACK gives your programs speed and control. Read files as fast as DOS, display data faster, load programs faster, control memory use, run any program from your program, copy-protect your disks, and much more. Fold-out memory map too! Disk (61 programs) & manual $45
- The popular PEEKS 'N' POKES shows you how to access and modify the status of the PC. Perform DOS and BIOS function calls from BASIC or Pascal! Learn how to find more Peeks 'N' Pokes and much more. Disk (58 programs) & manual $30. Shipping—$2.50/order. MC/VISA.

DATA BASE DECISIONS
14 Bonnie Lane
Atlanta, GA 30328
(404) 256-3860

BASICWINDDW

Screen Generator and Processor for BASIC programmers. This package combines a Screen Painter for creating and modifying screens and Macro Language and Compiler for quicker coding and testing. Features COLOR, field variables, complete input editing, line drawing. For BASIC, BASICA, and BASIC Compiler users. Includes manual and reference card. $99.95 VISA/MC accepted.

BasicWindow™

G. FREEMAN & COMPANY, INC.
15 Albin Road
Stamford, CT 06902
(203) 327-9868

THE SCREEN GENERATOR v 3.0

If you can't display a FULL COLOR data entry screen with up to 200 values and process it for Add, Update, Delete or Inquiry in LESS THAN TEN Basic or Assembler statements, then YOU need the NEW SCREEN GENERATOR v 3.0. Total screen management and data entry processing for the Novice to the Professional. $125.
K+S SYSTEMS
PO Box 643
Drexel Hill, PA 19026
(215) 449-2754

SYMBOLIC DEBUGGER

SYMD simplifies debugging by utilizing your source code symbols and line numbers. SYMD also lets you: Examine/change real numbers; Assign permanent breakpoints; Backtrace instruction execution sequences; Profile your program to find the most active spots. And much more. Introductory price at only $90.
D+V Systems
400 Amherst St.
Nashua, NH 03060
(603) 881-7140

CP/M WINCHESTER BACKUP

Backup database from a Winchester to a floppy
- Automatic Volume Management.
- Selective File Backup/Restore.
- Database Backup/Restore-under CP/M & CCPM
- Compression-reduces space required to store.

Requires IBM/XT or clone with 128K RAM & 1 diskette and Winchester drives. For ccpm & CP/M 86 $99.

AWARD SOFTWARE, INC.
236 North Santa Cruz Avenue Los Gatos CA 95030

AWARD SOFTWARE, INC.
236 North Santa Cruz Ave
Los Gatos, CA 95030
(408) 395-2773

COPYWRITE

COPYWRITE MAKES BACK up copies of all IBM PC software. No exceptions. CopyWrite is revised monthly, to keep up with the latest in copy protection, and comes with a trade in offer. It needs an IBM PC or XT, 64k bytes and one disk drive, but can use more memory or another drive. Price: $50 US funds. U.S. Inquiries.
QUAID SOFTWARE LIMITED
620 Jarvis Street, Suite 2412
Toronto, Ontario M4Y 2R8 Canada
(416) 961-8243

PADLOCK/PADLOCK II DISKS

PADLOCK furnishes the user with a method for providing protection against unauthorized duplication from DOS commands. $99. PADLOCK II disks come preformatted with finger-print and serialization. PADLOCK II disks offer superior protection. Ask about our fast data encryption product. All work with hard disk, EXE/COM files and all DOS versions. MC/VISA.
GLENCO ENGINEERING
3920 Ridge Ave.
Arlington Hts., IL 60004
(312) 392-2492

DDS Command Processor

File name expansion, command completion, and selective retry from a command history list (all with function keys). Flexible command line editing. Implements all DOS shell internal commands. Microsoft mouse support. Plus UNIX-like support tools. (Improved DIR, word count, etc.). Shell and tools $55.
LEMMA SYSTEMS INC
1508 Calle Del Ranchero NE
Albuquerque, NM 87106
(505) 268-7220

dREPORT FOR dBASE II

The Ultimate dBASE II Report Generator! Multi-file reports using 40 output fields. 9 selection criteria using 7 Boolean operators. 8 break levels with totals, subtotals, counts. 5 lines of output w/adjustable field widths. Multi-level sorting using dBASE II indexes. Titles & field headings. Only $95 + $5 s/h.
AUTOMATED OFFICE SYSTEMS
4160 Club Dr.
Atlanta, GA 30319
(404) 237-9420

PRINT MAGIC—$39.95

Your IBM/Epson printer can do it all! Layout pages every way imaginable: sideways; as a booklet, pamphlet...Set margins, char set, style & size (to 35 char per inch!). Preview on screen. Create & edit char sets (20 included!). Complete online help. Much more. All in easy menus. DOS, 128K. Check, MO (PA+6%)
DigiCon Print Package
Digital Concepts
PO Box 8345
Pittsburgh, PA 15218

FILEPATH VERSION 2.0

IBM-PC & PC/XT Owners: You Need FilePath Version 2.0, An Advanced DOS 2.0/2.1 Command.

*** POWERFUL USEFUL ***
*** CONVENIENT INEXPENSIVE ***
*** FIRST TIME USE OF WILDCARDS ***
*** IN PATH DEFINITIONS ***

Utilize the full power of DOS 2.0/2.1 directories with the advanced FilePath Version 2.0 command. Structure your files logically by application. Defines search paths for files like PATH does for commands. Crosses drive boundaries. Allows programs running on one directory or subdirectory to automatically access files in other directories or subdirectories. Can search all subdirectories in a specified directory. Eliminates the need for multiple copies of Default, Help, Configuration, and Overlay files. If you use LOTUS 1-2-3, WORD-STAR, PC TALK III, etc., you NEED FilePath Version 2.0.

*** CORPORATE LICENSES AVAILABLE ***

Send $24.50 plus $2.00 handling to:
SDA Associates, Department E, Box 36152
San Jose, Ca. 95158-6152 (408) 281-7747
California Residents Add $1.60 Sales Tax

SDA FILEPAQ

ADVANCED DOS 2.0/2.1 FILE UTILITIES

*** POWERFUL USEFUL ***
*** CONVENIENT INEXPENSIVE ***
*** FIRST TIME USE OF WILDCARDS ***
*** IN PATH DEFINITIONS ***

Four DOS 2.0/2.1 file utilities that can, on one or many directories, crossing drives as required, locate files and their file descriptions, delete files, remove directories, and modify file attributes. With a single command, and on one or many directories:
(1) SDADIR can locate any file and its file description or multiple files and their file descriptions, better yet, it can generate sorted lists by name, extension, data, size, and/or attributes;
(2) SDADEL can delete any file or multiple files;
(3) SDARD can remove any directory or subdirectory and all its files, or multiple directory/subdirectories and all their files;
(4) SDACHMD can modify the file attributes of any file or the file attributes of multiple files.

*** CORPORATE LICENSES AVAILABLE ***

Send $29.50 plus $2.50 handling to:
SDA Associates, Department E, Box 36152
San Jose, Ca. 95158-6152 (408) 281-7747
California Residents Add $1.92 Sales Tax

Hard Disk DIRECT ACCESS™

The ULTIMATE utility for any hard disk user. DIRECT ACCESS is a powerful hard disk management tool. Organizes your software programs into a "user defined" menu system. Features attractive screen display, rapid access into an application using a single keystroke & easy to learn. Also handles batch files & complicated DOS commands. Order today. Only $44.50 + $2.50 shipping. MC/VISA.
DELTA TECHNOLOGIES
PO Box 1104
Eau Claire, WI 54702
(715) 832-0958

DDS PATH Command For Data

Now your programs can access data files under DOS 2.0+ no matter where they are located. DPATH, a system—resident program extending the functionality of your DOS PATH command to include data files, includes a screen—oriented maintenance utility and a 60-page user manual. Requires PC-DOS 2.0. $25.
PERSONAL BUSINESS SOLUTIONS, INC.
P.O. Drawer 757
Frederick, Maryland 21701

DDS 2DDLS™ UTILITY PACKAGE

Unique, valuable utilities for DOS 2.0 + 2.1, not found elsewhere. Ends confusion + let all pre-2.0 programs use subdirectories. Move files between directories, remove deleted entries to speed searches + free disk space, show "tree" graph, log DOS usage. Over 30 programs, too much to describe here, for $65 + shipping.
Village INFORMATION CO., INC.
70 Greenwich Ave. Suite #300
NY, NY 10011
(212) 319-6420

COPY II PC

COPY II PC backs up protected & unprotected software, with verification. Available memory is fully utilized to minimize disk duplication time. Also includes a drive speed utility that can pinpoint drive problems. For IBM-PC. $39.95 + $3 s/h ($8 outside North America). Prepayment required. IBM PCjr version coming soon!
CENTRAL POINT SOFTWARE, INC.
9700 SW Capitol HWY #100B
Portland, Oregon 97219
(503) 244-5782

MICRDSDFT XENIX-UNIX SYS 3

Multi-user, multi-tasking System III plus Berkeley enhancements. Bourne Shell, "C" shell, the vsh visual shell, vi, almost 200 Utility prgms. Networking via uucp and Micnet (LAN). Utilities move files between DOS & XENIX. File & Record locking, 10 simultaneous prgms. Total OS-$595. Development pkg $595, Text pkg $495, all $1350.
Unidot Systems
602 Park Point Drive
Golden, CO 80401
(303) 526-9263

BLUEBOOK

SCREEN MANAGEMENT SYSTEM
SMS is simply the best utility available for designing, using, and saving color/monochrome screens GOSUB's are supplied in BASIC to input, output, and edit screen data fields Loads of extra features We have been in business 15 years, winning many awards for programming excellence Price $195, demo $50, Manual $10. VISA/MC PC/XT/PC jr /64K/1 Disk
ONA SYSTEMS, INC.
PO Box 1424
Saginaw, MI 48605
(517) 793-0185

SNOOP-DISKETTE UTILITY
Produce graphic maps of diskettes and files Comprehensive diskette analysis Add, delete or modify labels Pageable directory Change file attributes Display, modify or search diskettes or files More, in a single, easy-to-use program Reqs 64K, DOS 1.1, 2.0 or 2.1 PC, XT, JR & many compatibles, mono or color Introductory price $40, with manual
OTTER CREEK SOFTWARE
75 Hunting Lane
Goode, Virginia 24556

MEMORY SHIFT® PRICE SLASH
MEMORY SHIFT® allows your computer to run up to nine programs at once! You can swap programs in seconds & pass information between programs We are sure that this is one of the best products on the market at any price so we're offering an unconditional money-back guarantee!! NOW ONLY $79 (& shipping)
DATABASE SOLUTIONS
(800) 336-6060 or in CA (619) 236-1182

SOFTWARE

WORD PROCESSING

MULTIMATE™
Multimate™ is a function key oriented, menu-driven word processor comparable to larger dedicated systems The system offers over 100 WP functions and utilities including an 80,000 word speller/dictionary, merge, boiler plate callback and the most advanced printing and sheetfeeder capabilities An on-line help-facility, complete users manual and adhesive color coded key tabs are provided to facilitate minimal training time A truly user friendly system
SOFTWORD SYSTEMS, INC
52 Oakland Ave , North
E Hartford, CT 06108
(800) 243-4646

OFFICEWRITER
A Wang-like word processor designed for first-time users Continuous screen formating and logical keyboard layout make OfficeWriter one of the most natural word processors on the market Advanced features include mail merge, data base and spreadsheet interface, and document to ASCII conversion On-screen tutorial and help facilities included $325
OFFICE SOLUTIONS, INC.
5708 Odana Road
Madison, WI 53719
(608) 271-5047

LASER TYPE
Laser Type is an intelligent text formatter capable of generating table of contents, preface, index, line tables for term papers, software & technical manuals & books Laser Type is highly command oriented with sophisticated commands including keep areas, font selection boxed text chapter, section, subsection $395
SOFTLAB, INC
PO Box 879
St George, UT 84770
(801) 628-4969

PC-WRITE™
Features wordwrap, search/replace, justify, block move/copy/delete, headers/footers, etc Help screen, quick ref card, 100 page manual Split screen, edit two files at once Disk with software and manual $10; registration with support, source, and commissions $75 Shareware can copy and share with others Visa/MC
QUICKSOFT
219 First North #224c
Seattle, WA 98109
(206) 282-0452

WordPerfect
A powerful word processing package which comes with special features such as a spelling dictionary, math, text columns, footnotes, headers/footers, and macros Proportional spacing and special characters such as Greek, math and foreign symbols are supported Easy to learn and use $495
SATELLITE SOFTWARE INTERNATIONAL
288 West Center Street
Orem, UT 84057
(801) 224-8554

How to teach your kids about the IBM PC.

Now you can teach your children how to use your PC without bogging them down in the user manual...without spending hours demonstrating the simplest functions...and without fear that they'll break your PC because they don't know how to use it properly.

You can do it with the PC edition of *Computers for Kids*—a BASIC learning text whose Sinclair, Apple, and Atari editions have already introduced thousands of children and parents to computers.

Computers for Kids teaches children age 8 and older to write their own programs in less than an hour—without the necessity for previous knowledge of algebra, variables, or computers. And there's a special section that keeps parents and teachers on the same successful command path.

Starting off with an easy-to-understand explanation of how to use the IBM PC, your kids will progress quickly to flow charts and simple print programs...to loops, graphics, and other programming concepts that show the young user how to make the PC do exactly what he wants—in non-technical language that makes life easier for both of you.

Take it from Donald T. Piele, Professor of Mathematics at the University of Wisconsin (Parkside): *"Computers for Kids* is the best book available for introducing children to the IBM PC. And it's a perfect tool for adults who are learning about computers and programming *with* their children."

So do your children a favor. Do yourself a favor. Order the PC edition of *Computers for Kids* today!

Here are just a few of the useful and exciting topics covered in *Computers for Kids:*
- **What is a computer?**
- **Flowcharting**
- **Running the IBM PC**
- **Getting Ready to Program**
- **PRINT and Variables**
- **GOTO, INPUT and RND**
- **IF-THEN and FOR-NEXT**
- **Graphics Programs**
- **Sample Programs**
- **Glossary of Statements and Commands**
- **Notes for Teachers and Parents**

Creative Computing Press
Dept. NM3H 39 East Hanover Ave., Morris Plains, NJ 07950

Send me _____ *Computers for Kids*, PC edition, at $5.95 plus $1.50 postage and handling each. #12K

☐ **PAYMENT ENCLOSED** $_____. *Residents of CA, NJ and NY State add applicable sales tax. Outside USA add $3.00 per order.*

☐ **CHARGE MY:** (Charge and phone order $10 minimum)
☐ American Express ☐ MasterCard ☐ Visa

Card No._____ Exp. Date_____

Signature_____

Mr./Mrs./Ms._____
(please print full name)

Address_____ Apt._____

City/State/Zip_____

☐ Send me a FREE *Creative Computing* Catalog.

More PC Enhancements

ACP Key Values for your IBM PC™ and compatible computers

- **The Only PC Intelligent Modem that allows you to switch from Voice to data Communications.**

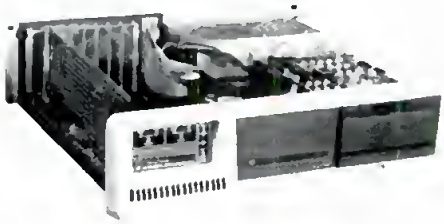
Most MODEMS will let your computer talk. The Bizcomp 1200 Baud MODEM allows you to transfer files and verify via telephone that they were properly received. You just plug your regular telephone handset into the back of your IBM PC/XT™

PC Intellimodem 1200 $439.00

- **10M Byte Hard Disk for the IBM PC.**

Now you can add 50% more capacity than the XT™. Just plug it in and it is ready to run. It is compatible to both the PC and the XT. Comes complete with controller card, data cable and internal mounting hardware. Requires no special software and will boot directly under DOS 2.0

Internal 10M Byte Hard Disk with Controller $995.00

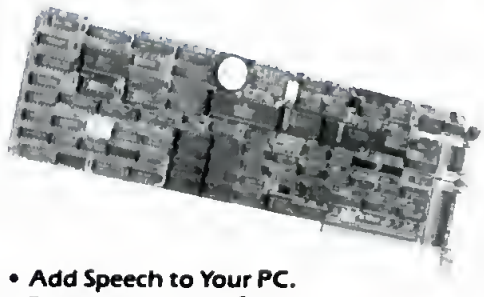


- **DYNAFRAME Hard Disk with Back-up Option and Expansion Slots.**

The DYNAFRAME by Vista is the ultimate add-on device for the IBM PC. If you are ready to add Hard disk to your IBM PC this is the optimum solution. We are offering the minimum configuration which consists of the DYNAFRAME IBM PC matching chassis, 10M bytes of Hard Disk and Controller, 130 watt switching power supply, and eight slots of expansion capability. If you desire back-up can be added later, either the Syquest Removable Hard Disk or the Cipher cartridge data streamer. This product is constructed with the highest quality possible — it is much more than a sheet metal box with a drive thrown in.

DYNAFRAME with 10M Bytes $2499.00

- **New Monochrome Graphics Board from AST.**



AST has the Optimum Solution to Lotus 1-2-3 grapics on the IBM PC Monographic Monitor. It increases the resolution from 640x200 to 720x348 and eliminates eyestrain caused by the IBM graphics adapter. You also get a parallel printer port, clock/calendar w/battery back-up and options include serial port. Now in stock at ACP.

AST MonoGraphic Plus $445.
Optional serial port add $35.00

- **Add Speech to Your PC.**

For the past several years Street Electronics has been the leading manufacturer of speech products. Their ECHO™ Speech technology is now available in the CRICKET™. The CRICKET has an RS-232 Serial Interface. Compatible with the PC and PCJr. Software included creates sound effects, music, natural voice (over 700 words supplied) and Robot voice. It has its own speaker and jack for headphones or stereo. The CRICKET is also compatible with the "Music Construction Set" by Electronic Arts.

Cricket for PC or PCJr. $135.00

- **MISCELLANEOUS**

PTI	
Back-up power supply up to 30 minutes stand-by power Compatible with most micros	**$328.00**
TRANSEND	
PC Modem card 1200 Baud	**$439.00**
PROMETHEUS	
ProModem 200/1200 Baud	**$469.00**
VERBATIM	
5¼ Head Cleaning Kit	**$ 10.95**
Disk Drive Analyzer	**$ 29.00**
TITAN	
Accelerator PC (8086 plus 128K Ram)	**$745.00**
ERGO-VISION	
Anti-glare screen. We have evaluated several and this screen gets top rating for the IBM	**$ 39.95**

64K rams

Set of 9 only $50.

- **Best Bargain Yet for Top Quality Color Monitors!**

SANYO

13" Color RGB Monitors with Audio. Ideal for IBM PC and compatibles. Both models have selector switch to turn your color monitor to green only. Take your choice of medium resolution with 5MHZ, 340x230 dots and 1000 character display. Or High Resolution with 7MHZ, 480x240 dots and 2000 character display.

Sanyo 6500 Medium Resolution $269.00
Sanyo 7500 High Resolution $389.00

ORDER NOW.

30 day money-back trial
We have no surcharges for Visa or Mastercard. One Day Service Available.

Add 3% Shipping and handling for UPS. Retail prices may vary. California residents add 6% Sales Tax.

(800) 854-8230

Toll Free or

(714) 558-8813

ADVANCED COMPUTER PRODUCTS

1310 E. Edinger Unit P
Santa Ana, CA 92705
TWX 910 595 1565
Since 1976

*All brand names are trademarks

CIRCLE 114 ON READER SERVICE CARD

MICROMAIL™

THE PC SYSTEM SPECIALIST

PRICES AND AVAILABILITY SUBJECT TO CHANGE WITHOUT NOTICE

SPECIAL OF THE MONTH

TAVA PC™

A Superior quality IBM PC Compatible Personal Computer. *Runs DOS 1.1, 2.0, 2.1, CP/M86®, UCSD p-System®, Runs Lotus 1-2-3®, Multi-plan®, WordStar®, PFS®, dBASEII®, and many more! Hardware includes 128K CPU, Floppy Controller, Two DS/DD Disk Drives, Video Monitor, Video Adapter, Parallel & Serial Ports.*

CALL FOR LOW PRICE
Suggested List $2395.00

FREE Lotus 123
or Gemini 10X
with TAVA purchase.

IBM PERSONAL COMPUTER

Special of the Month!

IBM PC® COMPLETE LINE

COMPLETE SYSTEM
VERY SPECIAL PRICE

64K, Two Disk Drives, Floppy Disk Controller, Video Card and High Res Monitor **$2399**

256K RAM, 360KB Disk Drive, FDC, Video Monitor & Adaptor 10MB Hard Disk Sub-System **$3990**

PRINTERS

OKIDATA 82	*120 cps*	**CALL**
OKIDATA 92	*160 cps*	**CALL**
OKIDATA 93	*160 cps*	**CALL**
OKIDATA 84	*200 cps*	**CALL**
EPSON FX 80	*160 cps*	**$499**
EPSON FX 100	*160 cps*	**CALL**
NEC 3550		**$1899**
DYNAX DX-15	*13 cps*	**$450**
BROTHER HR-1	*16 cps*	**$599**
BROTHER HR-25	*23 cps*	**$749**
GEMINI 10 X	*120 cps*	**CALL**
GEMINI 15 X	*120 cps*	**CALL**

DISK DRIVES

SLIM LINE	*QUMETRAC 142*	**$199**
	TOSHIBA	**$205**
	PANASONIC	**$199**
FULL SIZE	*TANDOM TM 100-2*	**$199**

PERIPHERAL CARDS

AST	*SIXPACK PLUS 64K*	**$299**
	MEGA PLUS 64K	**$299**
	I/O PLUS-1s, 1p, c	**$190**

PERIPHERAL CARDS

GAME/SERIAL/PAR	**$39**
64K MEMORY	**$50**
MONOGRAPHIC	**CALL**
HERCULES GRAPHICS CARD	**$369**
PLANTRONICS COLOR PLUS	**$439**
QUADRAM COLOR I/II	**CALL**
PARADISE MULTI-DISPLAY	**$489**

MONITORS

AMDEK	*300 G*	**$149**
	300 A	**$159**
	310 A	**$169**
PRINCETON	*HX-12*	**$490**
	SR-12	**CALL**
	MAX-12A	**CALL**
ROLAND	*MB-122 G*	**$139**
	MB-122 A	**$149**

MODEMS

HAYES	*1200B*	**CALL**
	1200	**CALL**
	300	**CALL**

MICROMAIL
631 E. First St., Tustin, CA 92680

(714) 838-9100

*IBM PC is a registered trademark of IBM Corp
dBASE II is a registered trademark of ASHTONTATE Inc
LOTUS 1 2 3 is a registered trademark of Lotus Development
Wordstar Spellstar Mailmerge are registered trademarks of Micropro International
Visicalc is a registered trademark of Visicorp

Multiplan is a registered trademark of Microsoft Corp
PFS is a registered trademark of Software Publishing Co
CP/M86 is a registered trademark of Digital Research Inc
MS DOS is a registered trademark of Microsoft Corp
UCSDp is a registered trademark of Softech Microsystems*

CIRCLE 201 ON READER SERVICE CARD

PC User Groups

This list is a partial directory of PC user group names and addresses. Use this listing to locate other PC aficionados who congregate in your area or around the world.

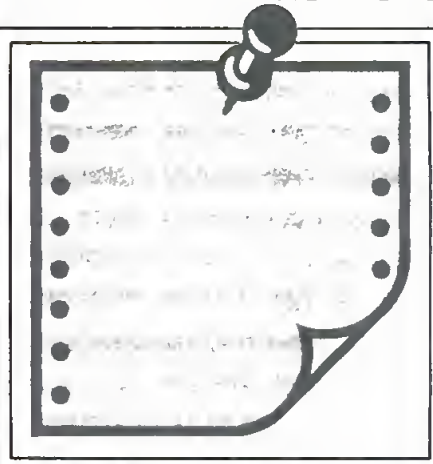
MICHIGAN

Birmingham Bloomfield IBM PC User Group
c/o Kenneth A.E. Kernen
534 S. Woodward
Birmingham, MI 41011
(313) 647-1900

Southwestern Michigan IBM PC Users Group
c/o R. K. Schmitt
2320 Crosswind Dr.
Kalamazoo, MI 49008
(616) 349-5381

South Eastern Michigan Computer Organization IBM SIG
c/o Darrell Frappier
P.O. Box 02426
Detroit, MI 48202
(313) 532-1390

Saginaw Valley IBM-PC Users Group
c/o Barry Kuznicki
Inacomp Computer Centers
3580 Bay Road
Saginaw, MI 48603



Grosse Pointe IBM PC Users Group
c/o Michael S. Skaff, Ph.D.,
585 Saddle Ln.
Grosse Pointe Woods, MI 48236

NEW YORK

QNPC
c/o Nathan Chao
Dept. of Computer Technology
Queensborough Community College
Bayside, NY 11364
(212) 631-6207

East Coast Club
c/o Richard Parker
ComputerLand
79 Westbury Ave.
Carle Place, NY 11514

NYPC: The NY IBM Personal Computer Users Group
80 Wall St., #614
New York, NY 10005
(212) 533-NYPC

Hudson Valley Personal Computing Club
c/o Jean Barnes
P.O. Box 6057
Kingston, NY 12401

The Manhattan IBM Micro Club
c/o Helaine Head
360 Central Park West
New York, NY 10025
(212) 222-9027

IBM PC Users Group of the New York Amateur Computer Club, Inc.
P.O. Box 106, Church St. Station
New York, NY 10008
(212) 864-4595

PC will publish a periodic listing of PC user groups. Send new addresses or address changes to "Club News," *PC*, One Park Ave., New York, NY 10016. New groups and address changes are shown entirely in **boldface.**

TOTAL CONTROL: PC/FORTH™

Complies with the New 83-Standard

GRAPHICS • GAMES • COMMUNICATIONS • ROBOTICS
DATA ACQUISITION • PROCESS CONTROL

- **PC/FORTH™**: interactive and conversational, but 20 times faster than BASIC.
- **PC/FORTH™** programs: highly structured, modular, easy to maintain.
- **PC FORTH™**: direct control over all interrupts, memory locations, and i/o ports.
- **PC/FORTH™**: full access to DOS files and functions.
- **PC/FORTH™** application programs can be compiled into turnkey COM files and distributed with no license fee.
- **PC/FORTH™** Cross Compilers available for ROM'ed or disk based applications on most microprocessors.
- **PC/FORTH™**: compatible with PC/XT, COMPAQ, and all hard disks.
- **PC/FORTH™**: for PC-DOS 1.1 and 2.0, CP/M-86®, Concurrent CP/M.

Trademarks: IBM, International Business Machines Corp.; CP/M, Digitel Research Inc.; PC/Forth+ and PC/GEN, Laboratory Microsystems Inc.

PC/FORTH™ $100.00
Includes interpreter/compiler with virtual memory and background multi-tasking, full screen editor. Assembler, utilities, 200-page technical manual. Upgrade to PC/FORTH+ available.

PC/FORTH+™ $250.00
Allows creation of FORTH programs up to 1 megabyte in size

DEMO DISK $5.00
Requires graphics card

Extension Packages

Forth Cross Compiler	$300.00
Advanced Color Graphics	$100.00
Intel 8087 Support	$100.00
Software Floating Point	$100.00
Interactive Symbolic Debugger	$100.00
PC/GEN™ Custom Character Sets	$ 50.00
PC/TERM for Smartmodem	$ 60.00
OTF+ Editor/Text Formatter	$100.00
Curry FORTH Programming Aids	$150.00
Cross Reference Utility	$ 25.00
B+ Tree Index Manager	$125.00
B+ Tree File and Index Manager	$200.00
Intel 8087 Processor	$200.00
"Starting FORTH" Tutorial	$ 16.00

VISA

LMI

Laboratory Microsystems Incorporated
Post Office Box 10430, Marina del Rey, CA 90295
Phone credit card orders to (213) 306-7412

MasterCard

CIRCLE 276 ON READER SERVICE CARD

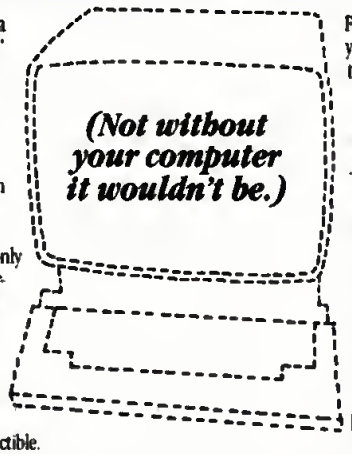
Business as Usual?

Business as usual these days means a computer that's up and "humming." But if your computer were stolen or damaged, you wouldn't have business as usual.

YOU'D HAVE TROUBLE!

You can get fast replacement for your entire system and be back in business in a hurry by protecting your computer with SAFEWARE Personal Computer Insurance. It's the only coverage designed specifically for personal computers used for business — in your office, shop or home.

SAFEWARE protects ALL hardware, ALL purchased software and ALL media against theft, damage or any other kind of loss, regardless of use, after a low $50 deductible.



Fast, courteous claims handling prevents your losing valuable business computing time.

Find the premium price for the coverage you need listed in the table below, *available for as low as $35 per year.* Fill in the coupon today. Your coverage will begin as soon as your coupon application is received. Or for even faster coverage, call our toll free number:

1-800-848-3469
(In Ohio call 1-614/262-0559)
Phones open 8 a.m. to 8 p.m., Monday through Saturday

SAFEWARE™

Total Hardware, Media & Software System Value	Annual Premium
Up to $ 2,000	$ 35
$ 2,001-$ 5,000	$ 60
$ 5,001-$ 8,000	$ 75
$ 8,001-$11,000	$ 90
$11,001-$14,000	$105

Call toll-free for rates on higher coverage. Coverage differs in Texas.
It is an underwriting requirement that you insure your system for its full value.

PCH

Mail to SAFEWARE, P.O. Box 02211, Columbus, OH 43202

Before I'm out of business,
please issue my SAFEWARE Insurance Coverage

Name _____

Street _____

City _____ State _____ Zip _____

System value $ _____ ☐Check Enclosed ☐VISA ☐MasterCard

Card # _____ Exp. Date _____

CLUB NEWS

The Long Island Computer Assoc.
P.O. Box 280
Commack, NY 11725

Picture City Personal Computer Programming Club
P.O. Box 36
Pittsford, NY 14534

Westchester PC Users' Group
c/o Andrew I. Sverlove
32 Pine Ridge Rd.
Larchmont, NY 10538
(914) 834-2012

BIBMUG
Buffalo IBM User's Group
P.O. Box 1487
Buffalo, NY 14221

The Northeastern New York IBM Personal Computer Users Group
c/o Jim Cummins
5 Jacob St.
Ballston Lake, NY 12019
(518) 399-3016

OHIO

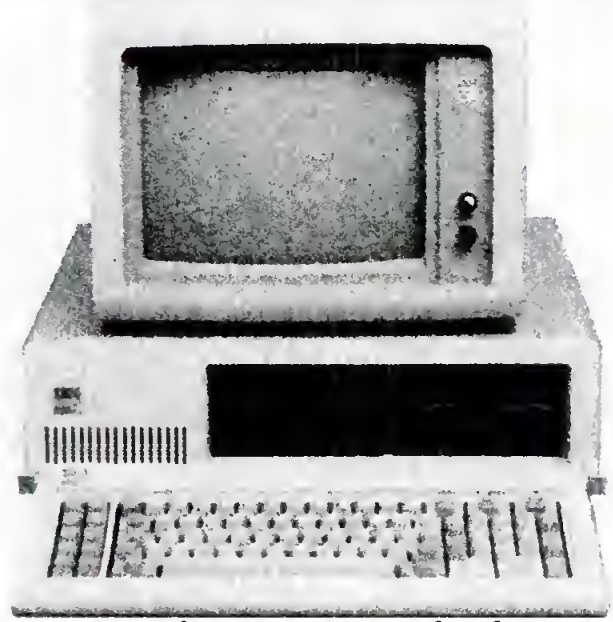
ACORN: Greater Cincinnati IBM PC User's Group
P.O. Box 3097
Cincinnati, OH 45201

Western Reserve IBM PC Association
c/o Larry Gavin
ComputerLand
2000 North Road SE
Warren, OH 44484

Lake-Ashtabula IBM Personal Computer Users Group
P.O. Box 175
Madison, OH 44057

IBM-PC Users Club
c/o Chuck Harrington
315 Cutler Hall
Ohio University
Athens, OH 45701
(614) 594-6125

friendly, dependable, intelligent, hardworking.



vulnerable.

A computer system is a valuable asset to your business. And like other valuables, it deserves reliable, effective protection.

The Data Defender Security System guards any computer or piece of electronic equipment against theft. Just place your electronic component on our pressure sensitive mat. If the equipment is lifted off the mat, the alarm will sound.

The tamper-resistant Data Defender can protect up to ten pieces of electronic equipment. It works with standard wall outlets, has a battery backup and is accessible only to keyholders. Best of all, this easy-to-use security system is just $198.

Protect your electronic assets. Invest in reasonably priced protection you can trust.

Call PICOtronics at 1-800-431-5007 for more information and to order your Data Defender today.

data defender SECURITY SYSTEM

PICOtronics, Inc. 820 East 47th B-10 Tucson, Arizona 85713

CIRCLE 268 ON READER SERVICE CARD

PC: Mart

CWE
PERSONAL SERVICE/FRIENDLY ADVICE
DISCOUNT PRICES

IBM® Diskettes
5¼" SS/DD — Soft box of 10 — $28
5¼" DS/DD — Soft box of 10 — $38
FREE! Plastic library case for 5¼" Diskettes
Also Maxell, BHSF, Nashua and more

JUST OUT: List CWE
Jack 2 first TRULY integrated software pkg. for IBM PC/XT — $495 — $298

FEATURING:
OSM ZEUS 4.2 CP/M. Runs over 4,000 user proven CP/M applications programs — *$5,595 — $4,899

TERMINALS
Televideo 925 — $995 — $699
950 — $1,195 — $899
Other models also
WYSE 50 — $695 — $549
100 — $995 — $878
Other models also — Prices subject to change without notice
Call NOW. We carry computers, and an extensive line of ALL computer related products. Business and Educational software a specialty

CORPORATE ACCOUNTS WELCOME
Circuits World Electronics Corp.
156 Depot Road, Huntington Station, N.Y. 11746
CALL COLLECT (516) 423-9100
MasterCharge, Visa, Personal Checks Accepted

IBM PC
SPECIAL $2,449 256K

2 Floppies 360K controller

KEYBOARD $125 IBM COLOR CARD $249
PLANTRONICS COLOR PLUS $379
immediate availability

IBM — XT in stock!!! $ CALL

COLUMBIA CORONA EAGLE XT SEEQUA $CALL

BHRT— NEVADA (800) 845-5555
ORDERS & INFORMATION (702) 451-3305
P.O. BOX 50029 HENDERSON, NV 89016 Mon-Fri 7:00 AM-5:30 PM

LOW PRICE-HIGH QUALITY PRODUCTS FOR PC's

MAXELL 5¼"	SS/DD ·	23.90
	DS/DD ·	35.90
DYSAN 5¼"	SS/DD ·	29.90
	DS/DD ·	39.90
IBM	DS/DD ·	CALL
D-BASE II ·		329.
MICROSOFT WORD ·		249.
WORD/MOUSE ·		309.
CYMA SOFTWARE ·		CALL
SUPER CALC 3 ·		229.
R:BASE 4000 ·		329.
SMARTMODEM 1200B ·		439.
SMARTMODEM 1200 ·		469.
WORD STAR PRO PACK ·		389.
LOTUS 123 ·		329.
AST SIXPAK PLUS 64K ·		269.

WE CARRY A COMPLETE LINE OF PRODUCTS. CALL FOR OUR FREE COMPUTER CATALOG

DATA BASE CO.
9778 Katella Ave. #106
Anaheim, CA. 92804
(714) 534-8140

CALL CREDITED TO ORDER
CA. RESIDENTS ADD 6% TAX
ADD 2% SHIPPING $3 MINIMUM

CIRCLE 841 ON READER SERVICE CARD

for you . . .
COMPUTER FURNITURE
by

the wood works

Handcrafted Hardwood & Hardwood Veneer Micro Computer Furniture. Enjoy the function & beauty of Oak, Walnut or Cherry. We can customize work stations to suit individual needs.

beginning at $175
MASTERCARD & VISA ACCEPTED

CALL FOR OUR COLOR BROCHURE
1-800-255-0524
Kansas Residents 913-842-7797
Rt. 2, Box 407 Lawrence, KS 66044

DISK DRIVES
(For PC, Mod I, III & IV)

Qume 142A	$209
Teac FD5SB	$179
Tandon TM100-2	$209
Tandon TM101-4	$295
CDC 9409	$219
Case and PS	$ 45

PC EXPANSIONS

Maynard Disk Controller	$162
Sandstar Series	$call
Internal 10 MB HD systems WS4	$959
WS1	$990
Quadboard (64K)	$269
Quadcolor I	$199
AST SixpackPlus (64K)	$269
MegaPlus (64K)	$269
I/O Plus	$114
2nd SP, PP or Game	$ 35
HERCULES graphics board	$349
HAYES Modems 300	$209
Smartmodem 1200	$489
Smartmodem 1200B	$435
Set of 9 chips (64K)	$ 55

VLM Computer Electronics
10 Park Place • Morristown, NJ 07960
(201) 267-3268 Visa, MC, Check or COD

ICs PROMPT DELIVERY!!!
SAME DAY SHIPPING (USUALLY)

64K DYNAMIC RAM ICs
200 ns @ $5.37
150 ns @ $5.37

256K DYNAMIC RAMS
150 ns @ $47.00

Place 512 Kbyte directly into IBM XT or PPC motherboard sockets with 18 256K ICs and propietary information kit @ $84.71
Add 512 Kbyte into XT or PPC
Increase motherboard memory to 640 Kbyte!
CONSUME 0 EXPANSION SLOTS!
We sell other memory ICs
8264, 2764, 27128, 27256, etc.

MasterCard/VISA or UPS CASH COD
Factory New, Prime Parts
MICROPROCESSORS UNLIMITED
24 000 South Peoria Ave (918) 267-4961
BEGGS, OK 74421
Prices shown above are for May 31, 1984
Please call for new discount & current prices. Prices subject to change. Please expect higher prices on some parts due to world wide shortages. Shipping and insurance extra. Cash discount prices shown. Small orders received by 5 PM CST can usually be delivered to you by the next morning via Federal Express Standard Air $9.95

PC THE BUYERS GUIDE

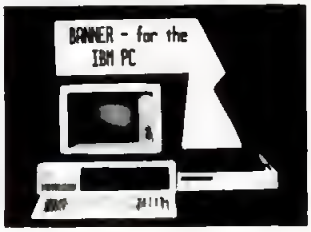
THE MASTER DIRECTORY OF PRODUCTS FOR THE IBM PC, PC XT, PCjr AND MOST COMPATIBLES!

AVAILABLE AT YOUR LOCAL NEWSSTAND AND COMPUTER STORE

AT $34.95, CK WILL PROBABLY SAVE TEN TIMES ITS COST!

CK is a money manager, an income and expense program, a recordkeeper, a charge account recorder, a budget organizer, a checkbook register, an account organizer—and more. With CK, you will know where your money went—and why! Handles 13 different accounts with 70 different accounts with 70 different categories available for each. Prints reports the way you want, by category, date, account, names, amount. With CK, you know where you are financially. At $34.95, plus $2.00 postage and handling, all you can do is save! Sold with the usual Overbeek Enterprise 30 day money-back guarantee. Specify MS/DOS, or computer and model number. Visa and Mastercard accepted.
Phone 312-697-8420 or write
OVERBEEK ENTERPRISES,
P.O. Box 726, Elgin, IL 60121
CK—another affordable program from Overbeek Enterprises

BANNER



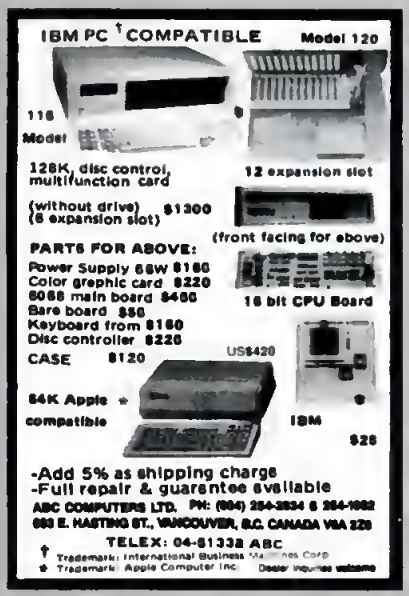
Print banners on your IBM PC* with the BANNER program. Design your own fonts with character design editor (included)! Requires 64K DOS 80 col display, one disk and printer. $39.95 (Visa, MC accepted)

To order call toll free (24 hrs/day).
800-824-7888 ask for operator 989
(In Alaska or Hawaii call 800-824-7919)

Sam Wilson & Associates
P.O. Box 37085 Houston, TX 77237
(713) 785-7830

*Trademark International Business Machines Corp.

CIRCLE 837 ON READER SERVICE CARD



We Help Bring Your Family Together

6 Types of Charts and Sheets
Indices
User Fields
Notes, Footnotes and Sources
No Limits
Adapts to Your Hardware
Comprehensive
Easy to Use

And Much, Much More

Send for brochure and sample printouts. Family Roots includes detailed manual and 2 full diskettes of programs for your Apple II®* or IBM PC®

Other genealogy software also available.

Price $185 plus $3.50 Postage

Visa, Mastercard Accepted

* TM Apple Computer, Inc

Family Roots

QUINSEPT, INC.

P.O. Box 216, Lexington, MA 02173 / (617) 862-0404

FREE CATALOG!

Just let us know and we'll mail you a FREE *Creative Computing* Catalog—16 pages filled with books, buyer's guides, magazines, and more!

To get your FREE catalog, write to: *Creative Computing* Catalog, Dept NA1X 39 East Hanover Ave., Morris Plains, NJ 07950.

CLUB NEWS

Northeast Ohio PC Club
c/o Kelvin Gerhart
P.O. Box 662
North Olmsted, OH 44070

Greater Cleveland PC Users Group
c/o Roy McCartney
30704 Royalview Dr.
Willowick, OH 44094
(216) 944-5173

Miami University IBM-PC Users Group
c/o Debra Allison
The Computing Center
Miami University
Oxford, OH 45056

Mansfield Area IBM PC Users Group
c/o Gary Stiffler
1145 Conwell Ave.
Willard, OH 44890

Akron/Canton PC Users Group
c/o James C. Finucane
10690 Clapsaddle Ave.
Alliance, OH 44601
(216) 935-0252

Columbus IBM-PC SIG
c/o Frank R. Neal
1358 Byron Ave.
Columbus, OH 43227
(613) 239-9300

The Ohio State University IBM PC-Users' Group
c/o Art Krumsee
Office of Continuing Education
210 Sullivant Hall
1813 North High St.
Columbus, OH 43212

TEXAS

Bay Area Personal Computer Organization (BAPCO)
c/o Earl Rubenstein
P.O. Box 58098
Houston, TX 77058-8098

Centex PC Users' Group
c/o Patti Anderson
P.O. Box 10169
Austin, TX 78766-1169
(512) 458-6996

Houston Area League of PC Users
c/o Scott Schultz
P.O. Box 610001
Houston, TX 77208
(713) 370-2398
ZACHARY*NET
713-933-7353

Dallas-Fort Worth User Club
c/o Samuel P. Cook
309 Lincolnshire
Irving, TX 75061
(214) 253-6979

West Texas Personal Computer Users Group
P.O. Box 8951
Amarillo, TX 79114

Texas User Group
c/o Ken Holcombe
178 Tipperary
San Antonio, TX 78223
(512) 333-7163

Southwest IBM PC Users Group
c/o William G. Barker & Associates
1009 West Randol Mill Rd., #212
Arlington, TX 76012

North Texas IBM-PC Users Group
2025 Rockcreek Dr.
Arlington, TX 76010

INTERNATIONAL

PC Club Zürich
c/o Kurt Fürer
Kuenzlistrasse 38
CH-8057 Zürich
Switzerland
(1) 363 02 90 ■

PIPELINE COMPUTERS

The Source For All IBM Compatible Products

SANYO UPGRADE KIT

★ One Teac 360K Disk Drive
★ Software for 360K Drive
★ Twice the Storage Capacity

List $399 **$239**

APPRICORN PORTS

★ Parallel Card or Serial Card

List $149 **$89**

IBMPC SYSTEM W/10 MEG

★ 256K, 2-360K Disk Drives
★ 10 Meg Hard Disk
★ Interface Card & Monitor

Other Configurations Available

List $4795 **$3495**

JUKI PRINTER

★ Model No. 6100
★ Bidirectionally 18 cps
★ Proportionally spacing

List $599 **$449**

IDEA MODEM

★ PC Internal 1200 Baud
★ Hayes Compatible
★ Complete w/software

List $495 **$349**

MAYNARD HARD DISK

★ 10 Meg Internal
★ Controller
★ Software Included

List $1495 **$998**

COMPAQ SYSTEM

★ 2 Drives, 360K
★ 256K of Ram

List $3495 **$2395**

64K MEMORY EXPANSION

★ 1 Year Warranty
★ 9 to a Set

List $89 **$49**

EPSON PRINTER

★ FX80
★ 160 cps

List $699 **$489**

PC DUST COVERS

★ Covers Monitor
★ Keyboard & Mainframe

List $29 **$19**

TEAC DISK DRIVE

★ FD55B
★ 360K Slimline
★ PC Compatible

List $299 **$169**

TAVA PC

★ 16 bit cpu ★ 128K Ram
★ Two 360K Drives
★ Mono Monitor
★ Parallel & Serial Ports

List $2495 **$1789**

The Source!

MasterCard

PIPELINE COMPUTERS

- We Accept MC, Visa, Wire Transfers, Certified Checks
- COD's Available
- All Prices Reflect a Prepaid Discount
- Shipping Minimum 4.50
- Purchase Orders Accepted
- This Ad Supersedes all Others

Prices Subject to Change

The Source!

VISA

CIRCLE 143 ON READER SERVICE CARD

CALL TOLL-FREE (800) 841-0905
For Lowest Prices & Fast Delivery

IBM COMPATIBLE DISK DRIVES

TANDON

TM-55-2, ½ Height (360K)	$ 209
TM-100-2 (360K)	$ 209

TEAC

FD55A Sgl. Head (160K)	$ 149
FD558 Dbl. Head (360K)	$ 169

PANASONIC — SHUGART

SA455-Panasonic	$ 159

CDC

9409 Dbl Head (360K)	$ 229

PRINTERS

OKIDATA

ML 82A (120 cps)	$ 319
ML 92A (160 cps)	429
ML 93A (160 cps) 15" carriage	729
82 & 92 Tractor Option	59
92 & 93 Plug & Play	49

C. ITOH

8510AP Prowriter	$ 339
F10-40 Starwriter	979
F-10-55 Printmaster	1319

JUKI

6100, 18 cps ltr. qual	$ 449
Tractor Feed	129

MODEMS

HAYES MICRO INC.

Smart Modem 300	$ 205
Smart Modem 1200	489
Internal 12008	399

ANCHOR

Mark VII 300 Baud	$ 94
Mark XII 1200 Baud	269

PROMETHEUS

ProCom 1200	$ 369

RIXON

PC212A, 1200 Baud Stand Alone	$ 409
P212A, 1200 I8MPC	409

U.S. ROBTICS

Password, 1200 Baud	$ 339

NOVATION

Access 123	$ 449

MONITORS

AMDEK

300G, 12" Green	$ 129
300A, 12" Amber	139
310A, 12" Amber Monochrome	169
Color I + Color Composite	299
Color II + RGB w/Cable	409

PRINCETON GRAPHICS

HX12, RGB PC Copy	$ 479

DISKETTES

PIPELINE

Dbl./Dbl. Reinforced Hub 1 year warranty	$ 19
Flip File Holds 70 (smk. plexiglass)	16

IBM & COMPATIBLE COMPUTERS

IBM

PC w/64K, 1 Drive (128K)	$1975
PC w/64K, 2 Drives	2195
PC XT, 128K 10 Meg Disk	4495
PC Jr.	1199

COMPAQ

Compaq 128K, 1 Drive	51895
Optional Drive	229

EAGLE

PC-2, 128K, 2-320K Drives	$2550
PC-2 +	2650

COLUMBIA

1600-1, 2-Drives (360K)	52595
1600-4, 12M8 Hard Disk	3875
MPC-XP Portable	2395

SANYO

MBC 550, 1-Drive, software	$ 789
MBC 555, 2-Drives, more software	1099
MBC 550-2	949
MBC 555-2	1295
Optional Serial Port	99

TAVA

2-Drives, 128K, 2 Ser. 1 Par Port, Color Graphics Card & Hi-Res. Green Monitor	$1895

INTERFACE CARDS FOR IBM & COMPATIBLES

AST RESEARCH

SixPac + 64K Par. & Ser. Software	$ 269
Mega + 64K exp. to 512K Ser. Port	269
MegaPack 256K option for Mega	279
I/O + Ser & Optional Par Game	149
Additional Ports	49

QUADRAM

Color I	$ 219
Color II	229
Quadlink	449
Quad Board I	239
Quad Board II	269

HERCULES

Color Graphics Card	$ 339

PLANTRONICS

Color +	$ 379

IBM

Dos 1.1	$ 39
Dos 2.1	59
Monochrome Monitor or Adaptor	309

FLOPPY DISK CONTROLLERS

Maynard	$ 169
Maynard w/Ser. Port	229
Maynard w/Par Port	229
Sigma Controller	159
Vista	159

PC PRODUCTS

Rainbow Color Card	$ 369

AMDEK

MAI Card	$ 489

DUST COVER

Covers Monitor, Mainframe & Keyboard	$ 19

MORE ACCESSORIES

Koala Graphics Tablet	$ 89
8087 Co-Processor	179
Kraft Joystick	39
Par. Printer Cable	39

The Source!

PIPELINE
COMPUTERS

ORDER DESK:
(213) 970-0177
(800) 841-0905
(OUTSIDE CALIFORNIA)

MAIL ORDER:
1142 Manhattan Avenue, CP21
Manhattan Beach, CA 90266

CUSTOMER SERVICE:
(213) 970-0177

Mon.-Fri. 8:00 a.m. to 6:00 p.m.
Saturday 9:00 a.m. to 1:00 p.m.

THINK BIG!

ADD A TDX NINE-TRACK, HALF INCH TAPE SUBSYSTEM TO YOUR IBM-PC & INTERFACE WITH THE WORLD.

ACCESS MAIN-FRAME TAPES AND TAPE LIBRARIES

READ AND WRITE ASCII OR EBCDIC TAPES DIRECTLY FROM APPLICATION PROGRAMS

BACK UP A 10 MEGABYTE DISK IN 5 MINUTES

TELEBYTE

A PUBLIC COMPANY

TDX Peripherals Division • Telebyte Technology, Inc. • 148 New York Ave., Halesite, NY 11743 • (516) 423-3232

CIRCLE 504 ON READER SERVICE CARD

Get SET for Speed

The SET command and the environment feature greatly speed entry of DOS commands and filenames.

The SET command is a new feature in PC-DOS 2.0 that many programmers have overlooked. This command lets you set up a table, called the environment, of strings of characters that stand for other strings when used in programs. I've used the SET command and environment feature to create abbreviations for DOS filenames and commands that let me work with fewer keystrokes. For example, after entering the command

```
A>SET D1=\TAXES\DATA
  \MARCH\EXPNS\
```

I could type D1 and get the same result as I could by typing the lengthy filename.

Before I could use the SET command this way, however, I had to modify the operating system's command processor, COMMAND.COM. In a previous column ("Enhancing PC-DOS," *PC*, Volume 3 Number 14), I described how the command processor worked and pointed out where modifications would be made. This time I'll tell you exactly how to use DEBUG to modify COMMAND.COM.

The first step is to add 1,024 bytes to the COMMAND.COM program, which will give you enough room to insert modified code. These 1,024 bytes are more than enough for the changes I'll describe in this article, so you can use the remainder to add improvements of your own.

Illustration: Michael Ng

Start with a disk containing a copy of DEBUG.COM and COMMAND.COM. (The following instructions assume that you've placed this disk in the A: drive. If you're working with the two files on a hard disk, you must make the appropriate adjustments for the filenames given in this explanation.) Run the DEBUG program and load COMMAND.COM into it by entering

(continued)

IBM PC™

64K, 1/360K Drive

$1875

Typical Configurations

IBM PC 64K

1 Drive, Monochrome Monitor & Card

$2249

or add

10 meg Internal Hard Disk

with these features:

—Half-height hard disk
—Plug compatible w/IBM XT™
—Uses IBM DOS 2.1
—One year warranty
—Requires no extra power

$3139

Compaq 256K, 2/360K drives	$2395
Compaq 256K, 1/360K drive, 10 meg internal	$3065
10 meg internal hard disk	$895
64K RAM chips for PC's	$49
Tandon TM 100-2, DS/DD	$210
Control Data 9409, DS/DD	$210
TEAC 55 B	$199
Taxan (green or amber) TTL mono	$175
Amdek 310 A mono	$175
Princetoo PGS HX-12 (RGB)	$499
Quadram QuadColor 1	$219
Persyst mono card w/parallel	$239
Quadram Quadjet	$695
TI 855	$849
Juki 6100	$469
Okidata ML92P	$469
Okidata ML93P	$775
AST SixPack Plus (64K)	$259
Quadram Quadboard (64K)	$289
MultiMate 3.22	$339
Multiplan	$149
ProKey 3.0	$89
Norton Utilities	$60
DbaseII	$349
Open Access	$349
Flight Simulator	$37
Wordstar ProPack	$415

Prices subject to change without notice.
SHIPPING FREE WITHIN USA, EXTRA FOR NEXT DAY AIR
ALL EQUIPMENT CARRIES FACTORY WARRANTY
IBM is a trademark of IBM Corp.
Credit Cards add 3% Quantity Pricing Available.

PC'S LIMITED

(512) 452-0323
CALL FOR
LATEST PRICES
7801 N. Lamar, #F-1
Austin, Texas 78752

CIRCLE 364 ON READER SERVICE CARD

ELIZA IS HERE!

AT LAST! A FULL IMPLEMENTATION of the original ELIZA program is now available to run on your IBM Personal Computer!

Created at MIT in 1966, ELIZA has become the world's most celebrated artificial intelligence demonstration program. ELIZA turns your computer into a non-directive psychotherapist with whom you can converse much as you would with a live therapist. She analyzes each statement as you type it in and then responds with her own comment or question. Response time is virtually instantaneous, and her remarks are often amazingly appropriate!

Designed to run on a large mainframe, ELIZA has never before been available to personal computer users except in greatly stripped down versions lacking the sophistication which made the original program so fascinating.

Now, our new IBM PC version possessing the **FULL** power and range of expression of the original is being offered at the introductory price of only $25. And if you want to find out how she does it (or teach her to do more), you can buy the complete IBM Disk BASIC **SOURCE PROGRAM** for only $20 additional.

Order your copy of ELIZA today and you'll never again wonder how to respond when you hear someone say, "Okay, let's see what this computer of yours can actually do!"

AVAILABLE ON DISK IN TWO VERSIONS FOR THE PC

1. Protected Version — $25
   (Protected Version can be run but not listed or modified)
2. Un-protected IBM Disk BASIC Source Version — $45
   (Source Version can be listed and modified as well as run)

Both versions include a six page user manual.
Please add $2.00 shipping and handling to the above amounts.
(California residents please add 6% sales tax)

ARTIFICIAL INTELLIGENCE RESEARCH GROUP
921 North La Jolla Avenue, Dept. P
Los Angeles, CA 90046
(213) 656-7368 (213) 654-2214
MC VISA and checks accepted

CIRCLE 128 ON READER SERVICE CARD

CIRCLE 296 ON READER SERVICE CARD


```
- A 1ED                          ; Assemble into memory at location 1EDh.
xxxx:01ED ADD DX,3270            ; Change file-size constant in load procedure.
xxxx:01F1 [Enter]                ; Pressing Return ends Assemble command.

- A 3AD
xxxx:03AD CMP BX,3B0            ; Increase the memory allocation value.
xxxx:03B1 [Enter]

- A 3CD
xxxx:03CD SUB BX,390            ; Subtract 400h from end of memory to get
xxxx:03D1 [Enter]                ;  starting segment of transient portion.

- A 891
xxxx:0691 MOV CX,37BE           ; Increases count of bytes that are read
xxxx:0894 [Enter]                ;  from COMMAND.COM file at load time.

- A 8A9
xxxx:08A9 CMP CX,37BE           ; Another increase of the file-size constant.
xxxx:08AD [Enter]

- A C9D
xxxx:0C9D SUB AX,390            ; Subtract again to find starting segment
xxxx:0CA0 [Enter]                ;  for COMMAND.COM's transient portion.

- A 1408
xxxx:1408 CALL 4030             ; Changed to call our new subroutine -
xxxx:140E [Enter]                ;  instead of subroutine now at 1948h.

- N 4030 4580 4430              ; Move the EXEC handler up
- F 4030 442F 0                 ;  and fill the vacated space with zeros.
- R CX                          ; To increase COMMAND.COM file size:
CX 4500                         ; Find the current value of CX,
:4900                           ; increase CX by 400h (1024 bytes greater).

- N COMMAND.TMP                 ; Rename COMMAND.COM, since we aren't done yet.
- W                             ; Write this file to disk to use in next step.

Writing 4900 bytes              ; This should appear on the screen.

- Q                             ; Quit the DEBUG program.  Return to DOS
```

Figure 1: *The code required to use DEBUG to expand COMMAND.COM.*

```
A>DEBUG COMMAND.COM
```

When the dash prompt (—) appears, start entering the code in Figure 1, which will use DEBUG's ASSEMBLE (A) command to change COMMAND.COM. At the beginning of each line in this figure—and on the screen as well—you'll see either a dash prompt or an address such as xxxx:01ED. In this case, xxxx is a placeholder for the number of the memory segment where DEBUG has loaded the file.

Comments follow most of the lines in Figure 1, but you don't have to key them in. After each line, press the Return key. The symbol [Enter] indicates where you should do nothing but press the Return key to finish an A command.

Creating the Subroutine

By following the instructions in Figure 1, you created COMMAND.TMP—a version of COMMAND.COM with space between its data work area and the EXEC handler. The next step is to create a subroutine for symbol substitution via the command processor's environment table. This subroutine will be located at offset 4030h in the COMMAND.COM file.

Begin with a disk containing COMMAND.TMP and DEBUG.COM. Place it in the A: drive and type

```
A>DEBUG COMMAND.TMP
```

Then start assembling code at offset 4030h. Following the dash prompt, enter

```
-A 4030
```

Now, after each address, enter the code given in Figure 2.

When you've finished entering Figure 2, and a dash prompt appears again, write the COMMAND.TMP file back to disk by entering

(continued)

QUENTIN

QUENTIN! DESIGN WITH THE USER IN MIND...

Quality, Reliability, Value...Compatibility

QUENTIN Winchester Disk Drives and Streamer Tape Backup Systems (Q-700, Q-500, and Q-400) were all designed to provide the ***Apple***, ***Franklin***, and ***IBM-PC*** user with reliable and flexible mass storage systems.

QUENTIN gives you a choice. Go with up to 20 MB of hard disk, the Q-500, add a streamer tape backup, the Q-400, now or later. Or, you can go with both capabilities built into one convenient unit, the Q-700.

QUENTIN gives you 100% software compatibility with all popular operating systems for the Apple and IBM-PC, plus high speed, high quality performance through extremely fast Direct Memory Access.

QUENTIN's easy to use features and advanced software engineering allows the system to grow with your needs.

QUENTIN systems' bottom line is simple and straightforward. . . quiet quality, reliability, and high performance at a reasonable price. . . QUENTIN!

For more information see your local computer dealer. Or, phone or write Quentin.

Quentin Corporation, 9207 Eton Ave., Chatsworth, CA 91311/(818) 709-6500

Dealer Inquiries Invited.

Quentin is a registered trademark of Quentin Corporation. / Apple is a registered trademark of Apple Computer, Inc. / Franklin is a registered trademark of Franklin Computer Corporation. / IBM-PC is a registered trademark of International Business Machines, Inc.

CIRCLE 354 ON READER SERVICE CARD

```
-A 4030
xxxx:4030 MOV     SI,2BBB       ; Source:  address of user's input.
xxxx:4033 MOV     BX,3000       ; Point to temporary buffer area.
xxxx:4036 XOR     DX,DX         ; This register acts as a flag.
xxxx:403B MOV     ES,[2CA0]     ; Get segment address of RESIDENT.
xxxx:403C ES:                   ; in that segment, find segment
xxxx:403D MOV     ES,[0B1C]     ;  address of the environment.

xxxx:4041 LODSB                 ; Here is main loop: First, get a character
xxxx:4042 CMP     AL,27         ;  from the input, and test for quote mark.
xxxx:4044 JZ      4065          ; Skip to symbol search (4065) if a quote.
xxxx:4046 MOV     [BX],AL       ; Otherwise, move input to buffer area.
xxxx:4048 INC     BX            ; Bump to next spot in buffer.
xxxx:4049 CMP     AL,0D         ; See if last char. was end of line.
xxxx:404B JNZ     4041          ; if not, go back to start of main loop.

xxxx:404D PUSH    CS            ; This is end of routine, after main loop.
xxxx:404E POP     ES            ; Get code segment back in ES register.
xxxx:404F MOV     CX,0BB6       ; Load the address of next routine.
xxxx:4052 OR      DX,DX         ; DX will be zero if no symbols input.
xxxx:4054 JZ      4063          ; Skip move if DX=0.
xxxx:4056 MOV     SI,3000       ; SI points to temporary buffer.
xxxx:4059 MOV     DI,2BBB       ; DI is user's input area.
xxxx:405C MOVSB                 ; Move one char. from temp. area.
xxxx:405D CMP BY [DI-01],0D     ; See if that char. was end of line.
xxxx:4061 JNZ     405C          ; if not, move another character.
xxxx:4063 JMP     CX            ; Jump to the code at 0BB6h. END

; The above is the main body of the code.  It moves each character
; from the original input to a temporary work area.  Then it tests each
; character for the single quote mark.  If no quote mark is found, it just
; exits to the next routine without doing anything.  Otherwise, it jumps
; down here to search for a match with the string between quote marks.

xxxx:4065 MOV     DX,SI         ; Save input pointer.
xxxx:4067 MOV     DI,0001       ; Initialize environment pointer.

xxxx:406A DEC     DI            ; Adjust for one extra increment (see below)
xxxx:406B MOV     SI,DX         ; When branching back, restores input.

xxxx:406D LODSB                 ; inner loop: match input with environment.
xxxx:406E CMP     AL,0D         ; See if end hit before closing quote.
xxxx:4070 JZ      4046          ; If so, skip back to termination code.
xxxx:4072 CMP     AL,27         ; Test for user's closing quote mark.
xxxx:4074 JNZ     40BB          ; If no quote, go to 40BB to test environ.

xxxx:4076 MOV     AL,3D         ; Move an equal sign (=) to AL so can
xxxx:4078 SCASB                 ;  compare against environment.
xxxx:4079 JNZ     4095          ; if not an equal sign, not a match.

xxxx:407B ES:                   ; Do if there is a match: move environment's
```

Figure 2: *The subroutine that will enable the COMMAND progrom to substitute values from the environment toble for symbols surrounded by single quotation (') marks.*

(Figure 2 continues)

```
xxxx:407C MOV     AL,[DI]       ;  definition of symbol to TEMP.
xxxx:407E OR      AL,AL         ; Test for end of definition string.
xxxx:4080 JZ      4041          ; If zero, string moved: return to main loop
xxxx:4082 MOV     [BX],AL       ; Otherwise, move character to TEMP.
xxxx:4084 INC     BX            ; Bump the two index registers.
xxxx:4085 INC     DI
xxxx:4086 JMP     407B          ; Continue match loop until zero is reached.

xxxx:4088 CMP     AL,61         ; Come here to test input against the
xxxx:408A JB      4092          ;  symbols in environment.  These
xxxx:408C CMP     AL,7A         ;  instructions will convert
xxxx:408E JA      4092          ;  lower-case alphabetical
xxxx:4090 AND     AL,5F         ;  characters to upper-case,

xxxx:4092 SCASB                 ; Compares input char. against environment.
xxxx:4093 JZ      406D          ; If char. is  equal, go back for another.

xxxx:4095 DEC     SI            ; if not equal, then find next symbol in
xxxx:4096 XOR     CX,CX         ;  the environment:
xxxx:4098 MOV     AL,CL         ; For the zero-byte that ends the
xxxx:409A DEC     CX            ;  environment entry just tested.
xxxx:4098 REPNZ                 ; Search the next 65535 chars. for zero.
xxxx:409C SCASB                 ;  (Second half of last instruction.)
xxxx:409D SCASB                 ; Found the first 00, check for another.
xxxx:409E JNZ     406A          ; if not a zero, then check more symbols.

xxxx:40A0 LODSB                 ; Have reached the end of environment, with
xxxx:40A1 CMP     AL,27         ;  no match.  Skip past the quoted string
xxxx:40A3 JZ      4041          ;  and return to top if end quote is found.
xxxx:40A5 CMP     AL,0D         ; If end of line is found, terminate
xxxx:40A7 JZ      4046          ;  the procedure.
xxxx:40A9 JMP     40A0          ; Looping until end of line or end quote.

xxxx:40AC [Enter]               ; Press Return after last input.      (Figure 2 ends)
```

```
-W
```

On the screen you should see the message, "Writing 4900 bytes." Then quit DEBUG and return to DOS by entering

```
-Q
```

The final step is to copy your modified command processor over the old COMMAND.COM. Enter

```
A>COPY COMMAND.TMP
COMMAND.COM
```

The display should reply with "1 file(s) copied." Press Ctrl-Alt-Del to reboot the system, loading the new version of COMMAND.COM, and see whether everything operates normally. If the computer shows any signs of odd behavior, you probably made a mistake at some point while entering the code. Retrace your steps carefully and try again.

SET Ready to Go

After you make sure your modifications have done no harm, you can test whether or not they accomplish what you want. First enter the command

```
A>DIR 'COMSPEC'
```

The display should say, "COMMAND COM 18688" followed by the date and time. Now enter this on a single line:

```
A>SET X=Hello. This is proof
that substitution works.
```

After that, enter

```
A>ECHO 'X'
```

and the screen should display the message "Hello. This is proof that . . ."

An Option for Assemblers

If you have an assembler for your PC, you can use it instead of DEBUG to create the subroutine in Figure 2. With the assembler, you could write a text file of source code, assemble and link it, and then merge the resulting object code into the COMMAND.TMP file, created in Figure 1. If you'd like a printed listing of assembler source code equivalent to the instructions in Figure 2, send a self-addressed, stamped envelope to Environment Code #15, *PC Magazine*, One Park Avenue, New York, NY 10016. ■

MICRO MART™ STRICTLY BUSINESS AT A DISCOUNT

floppy disk drives

IBM

TANDON TM 100-2 FULLY IBM PC COMPATIBLE — $209
CALL FOR QUANTITY PRICING

½ HT. DISK DRIVES TOP NAMES — $179
SOUTH'S LARGEST SUPPLY•DEALER INQUIRIES INVITED . . .

networking/protocol conversion

PC Turbo by ORCHID
80186 Co-processor Board • Speeds Up PC 5 Times

IRMA "STILL A BEAUTY" REPLACES 3278's WITH PC's /IRMALINE

PC Blossom 64 386K Multifunction Board W/Opt. PCnet Interface

BLUE LYNX 5251/3276 EMULATOR

FORTE DATA 3278/3279 Emulator w/SIIIG, Plus Graphics Capability

SNA & BISYNC • 3780, 5251, 3274

printers

AMDEK AMPLOT II Supports LOTUS 1 2 3 Graphics $799
Houst. Inst. Plotters & Digitizer . . CALL!

DOT MATRIX

EPSON FX80 & 100 (160 cps) . . . . Best Price!
EPSON RX80T or F/T . . . . . Best Price!
EPSON RX100 . . . . . Best Price!
EPSON LQ 1500 NEW! Letter Quality in a Dot Matrix . . . . . Best Price!
ProWriter $339
Prism Color IBM's Choice for LESS, 132 Col (200 cps) Color Graphics $1495
OKIDATA 92&93 Opt IBM Prome 160 cps . . . . . Best Price!
OKIDATA ML84 200 cps . . . . . Best Price!
OKIDATA 2410 Pacemark (350 cps) . . . . Best Price!
TOSHIBA P-1351 & 1340 . . . Best Price!
GEMINI Full Line of Star Micronic Prints . . . . . Starting at $285
T.I. 855 24 WIRE PIN HEAD, NOW IN STOCK! . . . . Best Price!
NEC P2 & P3 180 cps . . . . . Best Price!
DIABLO P38 (400 CPS) $1895

LETTER QUALITY

NEC SPINWRITERS 2050, 3550 & 7730 Best Price!
DIABLO 620, 630 630 ECS . . . . . Best Price!
C-ITOH Starwriter (40 cps) Printmaster (55 cps) . . . . . $1055/$1455
QUME SPRINT 11/40 PLUS SPRINT 11/55 PLUS . . . . . Best Price!
LQ Feeders Great Cut Sheet Feeders for NEC 3550 & C-ITOH Starwriter . . . . . SAVE!

chips

CALL FOR QUOTE ON QUANTITY CHIP PURCHASES

INTEL High Speed Math Coprocessor $175
64K RAMCHIPS . . . . . $55/$159
(64K-9 Chip/Upgrade Kit) (192K-27 Chip/Upgrade Kit)

Atlanta, Charlotte, Washington D.C., Tampa, Ft. Lauderdale, Orlando, Louisville

hard disks

Peachtree Peripherals **P-10** Industry's Best Buy•10 Meg/F. Auto Boot•Runs W/Out Ext. Power Internal or External Installation

SYSGEN 10 & 20 MEG/F W/Streamer Tape *Faster Streaming & Formatting* . . . . . CALL!
INFAX Bernoulli Box • 10 MEG Removable Cartridges • Double Drives . . . . . CALL!
DAVONG 10 MEG/F 15, 21, 35 Available External . . . . . CALL!
SYSGEN IMAGE Streamer Tape Back Up For Your IBM XT . . . . . CALL!

ALL NAME BRANDS AVAILABLE NOW! BEST PRICES!!
IF YOU DON'T SEE IT— . . . . . CALL!

multifunction boards

ULTRA PAK Monographics•Serial Port(s)•Par. Port Expend. RAM (384K)•Floppy Cont.•Opt. Color . CALL!
#1-384K 64 384K•Clock Set & Par Pte Ram Disk•Spooler•Opt Game Pt . . . . . Best Price!
#1 MultiCard Max: 8 Func (64-512K) W/Opt. Game Pt. . . . . Best Price!
#1 I/O Card Ser. Clk. Spooler Ram Disk (Opt 2nd Ser, Par & Game) . . . . . Best Price!
QUADBOARD New Version 64 384K . . . . . CALL!
CAPTAIN 64 384K $269
SEATTLE RAM + 3 0-256K•Ser•Par Flash Disk•Clk•Spooler $199
J-RAM II 512K Multifunction . . . . . CALL!
PROFIT Systems 84 512K RAM Plus & Elite . . . . $299/$880
BABY BLUE II 64-256K•2808•Par•2 Ser•Clk RAMdisk•Spooler•Extra Software . Best Price!
PC Blossom ORCHID's 8-Pak Clone with Optional PCnet Piggy Back . . . . . starting at $275
MAYNARD SANDSTAR Floppy & Hard Disk Controller Cards . . . Best Price!

monitors & crt's

PGS-MAX 12 Amber • Runs off IBM Mono Card • 720h x 350v . . . . Best Price!
PGS SR-12 690x480 • Non-Interlaced Mode RGB W/HiRes Text, W/Dual Scan Cd . . Best Price!
PGS-HX 12 HiRes 690 Dot RGB . . . . . Best Price!
QUADCHROME HiRes RGB . . . . . Best Price!
AMDEK COLOR II+ $399
AMDEK COLOR IV 720 Dot $549
AMDEK 300 A/300G 12" . . . . . $149/$139
AMDEK 310A Amber 12" Improved Alternate to IBM Green Screen $185
Wyse Terminals Wy 300, 100, 75, 60, 50 Entire Line In Stock . . . . . Best Price!

THE SERVICE LEADER ★ CORPORATE BUYERS WELCOME

IBM software

Infoscope — Critically acclaimed data basa. See *Byte* June 84, Vol. 9, No 6 — **Best Price!**

ACCOUNTING

IUS A.R., A.P., G.L., Inventory, Order Entry, Payroll . . . . . Starting at $299

Peachtree Accounting A.R., A.P., G.L., Payroll Job Cost, Inv., Order Proc.. CALL!

MISCELLANEOUS

Dow Jones Entra Line Now W/Full Acct., Comm. & Sales Plan. Complementing Fine Stk. Mkt. Pkg . . CALL!

Open Access Spraadsheet, 3-D Graphics, Word Processor, Time Manager & Comm. in One Pkg. $299

Decision Manager All New Integrated Softwara by Paachtraa . . . . . CALL!

VisiOn Applications Manager Calc • Word • Graph • Duary . . . . . CALL!

FRIDAY! Ashton Tata . . . . . CALL!

QUICKCODE/dGRAPH/dUtil . . . . . CALL!

Lattice C-Compilers Version 2.1 Supports One Mag RAM on PC $299

MICROSOFT COMPILERS. . . . . CALL!

DIGITAL RESEARCH COMPILERS . . CALL!

Norton Utilities A must for Evary IBM PC $59

ProKey 3.0 Rosasoft $95

Copy II PC $35

ATI Training Critics Choica Software Tutorials $49

Set-FX PLUS Epson FX Saries Control Pkg. $45

Sideways Inverts Printout $49

PC Paint Brush Amazing Mousa Drivan Graphics W/Scraan Dump Utilkty $129

Chart-Master/Sign-Master . . . . . CALL!

"CAD Systems" Best Selection Available of Computar Aided Dasign Graphics. . . . CALL!

ENERGRAPHICS Hot New Graphics Package $269

modems

HAYES SMARTMODEM 300, 1200 & 12008 . . . . . CALL!

NOVATION MICRO MODEMS, W/Access 1-2-3; Internal w/Crosstalk XVI . . . . . Starting at $99

RIXON 1200-4800 BAUD • IBM PC Compatible . . . . . CALL!

Signalman Mark XII 300 1200 Direct Connect. $259

graphic cards

HERCULES Monochrome Graphics Supports LOTUS 1 2 3 . . . . . CALL!

PLANTRONICS Color + 8-plaaer, Super HuRas With Color Magic . . . CALL!

Graphics Master Tecmar Color & Mono Graphics Supporting Lotus . Low Price!

QUADCOLOR I & II . . . . . CALL!

Paradise Sys. Color Graphics/Monochrome Parallel Printer Port $379

STB Graphix Plus Color & Mono Graphic • Par Port RAM Disk • Spooler • Lita Pan Port • Opt Clk Cal . . . . . CALL!

Multigraph 132 Col in Mono W Graphics 720h x 350v Color Graphics to 640h x 400v • Opt Par Port . . . $375

Amdek MAI Color Graphics Monochrome Par Prt Port 8 Pages Storage HALO Light Pen Port Super W Color IV . . $345

Advertised cash prices subject to change without notice

WORD PROCESSING

MultiMate 3.22 "WANG" Style Word Processor with Spelling Checker & All New Tutorial $289

SAMNA II & III Daluxa Word Processing at Best Pricing . . CALL!

Microsoft Word W/&W/o Mouse•Fourth Generation Word Processor•Use Up to 8 Windows . . . . CALL!

VOLKSWRITER DELUXE $189

WordStar ProPack Now W/Free Tutor! CorrectStar, MailMarge. . . . . CALL!

WordPerfect by SSI * Available Now by Popular Demand $299

Easy Writer II Systems Include Speller & Mailer . . . . . CALL!

Peach Text 5000 Parsonal Productivity Series. $179

DATA BASE

HARVARD PROJECT MANAGER . . . CALL!

Day Flo Super new data basa . . . . . CALL!

R:base 4000 or 6000 Report Writer & Clout Microrim . . . . . Starts at $329

Power-base GMS Systams•Combination of Relational & Hierarchical Data Base . . . . . CALL!

Knowledge Man Var. 1.05 Now Available for this Highly Acclaimed Data Base $295

dBasell & III Ashton Tata • Standard plus New "C" Language . . . . . CALL!

SPREADSHEET

MultiPlan Microsoft • New Low Pricing . . . . . CALL!

SuperCalc 3 Superior Graphics to LOTUS . . . . . CALL!

COMMUNICATIONS

CROSSTALK XVI Microstuf . . . . . CALL!

SMARTCOM II Hayes $99

miscellaneous

Keytronics 5151 New Improved . . . . . CALL!

MOUSE Optical Type LOTUS & VisiOn Compatible By Mouse Systems $209

CURTIS Monitor Pedestal Kayboard Extension Cable, Monitor Extension Cable . . . CALL!

MICROFAZER (8K-128K) Stack Spooler . . . . . Starting At $139

BACK UP Power Supply 200/425/625 Watts . . CALL!

ISOBAR Surge Protectors • With Great Filtering Via Isolated Outlet Pairing • 4 & 8 Plug . . . . . Starting at $55

IBM is a registered trademark of International Business Machines
Micro Mart is a registered trademark of Micro Mart Inc.

ORDERS ONLY
1-800-241-8149

MICRO MART™

TECHNOLOGY CORPORATE CAMPUS
3159 Campus Drive • Norcross, GA 30071

For Information	1-404-449-8089
Technical Support	1-404-446-3836
Telex	880497

COMPUCLASSICS

INCREDIBLE PRICES WITH PROFESSIONAL SUPPORT

SOFTWARE

ASHTON TATE
DBASE II $289
DBASE III 399
FRIDAY 169
FRAMEWORK 399

CONTINENTAL SOFTWARE
HOME ACCOUNTANT PLUS 85
PROPERTY MANAGEMENT 319

DIGITAL RESEARCH
C BASIC COMPILER 360
PASCAL MT + ... 360
C 209

LOTUS DEVELOPMENT
1-2-3 309
SYMPHONY ..... CALL

MICROPRO
INFOSTAR 239
WORDSTAR 235
WORDSTAR PRO-PAC 345
MAILMERGE 129
CORRECTSTAR 129
PLANSTAR 289

MICROSOFT
MULTIPLAN 125
WORD 239
WORD AND MOUSE 299
BASIC COMPILER 249
PASCAL COMPILER 249
FORTRAN COMPILER 249
BASIC INTERPRETER 249

MICRORIM
R BASE 4000 289
EXTENDED REPORT WRITER 89

MONOGRAM
DOLLARS AND SENSE 109

SATELLITE SOFTWARE INTL.
WORD PERFECT 279

SOFTWARE PRODUCTS INTL.
OPEN ACCESS 379

SORCIM
SUPERCALC II 159
SUPERCALC III 229

SOFTWORD SYSTEMS
MULTIMATE 279

SOFTWARE PUBLISHING
PFS REPORT $89
PFS FILE (IBM) 85
PFS FILE (APPLE) 89
PFS GRAPH (IBM) 85
PFS GRAPH (APPLE) 69
PFS WRITE (IBM) 85
PFS WRITE (APPLE) 69

LEADING EDGE SOFTWARE
WORDPROCESSOR 89
WORDPROCESSOR/MERGEPRINT 130
NUTSHELL 275

WOOLF SOFTWARE
MOVE-IT 85

MICROSTUF
CROSSTALK 109
INFOSCOPE 125

PEACHTREE
PEACH PAK 4 229
PEACH TEXT 5000 229

- CORPORATE ACCOUNTS WELCOME.
- WE ACCEPT VISA & MASTER CHARGE.
- NO CREDIT CARD SURCHARGE.
- FREE TECHNICAL SUPPORT.
- CALL FOR OTHER SOFTWARE & HARDWARE PRICES.

HOURS
ORDER DESK & TECHNICAL SUPPORT OPEN
8AM - 6PM MONDAY THRU FRIDAY
10AM - 2PM SATURDAY

6860 CANBY ST. (SUITE 109)
RESEDA, CA 91335
TLX 292415 KET UR

SHIPPING
$4 per item UPS surface ($8 for Blue Label): printers $25

HARDWARE

HAYES
SMARTMODEM 300 205
SMARTMODEM 1200B 419
SMARTMODEM 1200 485

HERCULES GRAPHICS CARD
..... 349

MICROSOFT
64K RAM CARD 235
256K RAM CARD 359

C.ITOH
PROWRITER 8510 339
PROWRITER 1550 619
STARWRITER 40CPS 1100

STAR MICRONICS
GEMINI 10X 285
GEMINI 15X 419

AST RESEARCH
MEGAPLUS 64K 275
SIX PAC PLUS 64K 275

OKIDATA
MICROLINE 82A 329
MICROLINE 92 469
MICROLINE 93 785

TO ORDER CALL:
1-800-328-4473 or (818) 705-1895 (CA.)

TERMS
ALL prices subject to change. We honor Cashiers Cheque/MO/Bank transfers immediately. Allow time for company & personal cheques to clear. California residents add sales tax

CIRCLE 205 ON READER SERVICE CARD

Void after November 15, 1984

101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125
126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150
151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175
176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200
201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225
226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250
251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275
276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300
301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325
326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350
351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375
376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400
401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425
426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450
451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475
476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500
501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525
526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550
551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575
576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 596 599 600
601 602 603 604 805 606 607 608 609 610 611 612 613 614 615 616 617 818 619 820 621 822 823 624 625
626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 841 842 843 844 845 846 847 848 659 650
651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 889 870 671 872 673 874 875
676 677 678 679 680 681 682 683 684 665 686 687 688 689 690 691 692 693 894 895 696 897 898 899 700
701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725
726 727 726 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750
751 752 753 754 755 756 757 758 759 760 781 762 763 784 785 768 787 768 789 770 771 772 773 774 775
776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800
801 802 803 804 805 808 807 808 809 810 811 812 813 614 815 816 817 818 819 820 821 822 823 824 825
826 827 828 829 830 831 832 833 834 835 836 837 838 639 840 841 842 843 844 845 848 847 848 849 850
851 852 853 854 855 856 857 858 859 860 861 862 863 864 885 868 887 868 869 870 871 872 873 874 875
676 877 878 879 880 881 882 883 884 885 886 887 868 889 890 891 892 893 894 895 896 897 898 899 900

1 Please indicate which of the following microcomputers you currently own and/or plan to buy in the next 12 months.

	Own	*Plan to Buy*
IBM PC	A	G
IBM XT	B	H
PC*jr*	C	I
3270 PC	D	J
XT/370	E	K
Other (specify)	F	L

2 For what, if any, business application(s) do you use the microcomputer you currently own?_____

PLEASE PRINT CLEARLY—Use only one card per person.

NAME_____ PHONE NO. (_____)_____

COMPANY_____ TITLE_____

ADDRESS_____ APT.____

CITY_____ STATE_____ ZIP_____

(Zip code must be included to insure delivery) PC8/7-2

4 ☐ **Please send me 1 yeer (26 issues) of *PC Magazine* for $29.97 and bill me. (Full 1 year subscription price of $34.97.)**

Void after November 15, 1984

101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125
128 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 148 147 148 149 150
151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 168 167 168 169 170 171 172 173 174 175
176 177 178 179 180 181 182 163 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200
201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225
226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250
251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 268 267 268 289 270 271 272 273 274 275
276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300
301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325
326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350
351 352 353 354 355 356 357 358 359 360 361 362 383 364 365 366 367 368 369 370 371 372 373 374 375
376 377 378 379 380 361 382 383 384 385 388 387 388 389 390 391 392 393 394 395 396 397 398 399 400
401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425
426 427 428 429 430 431 432 433 434 435 436 437 436 439 440 441 442 443 444 445 448 447 448 449 450
451 452 453 454 455 456 457 458 459 480 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475
478 477 478 479 480 481 482 483 484 485 488 487 488 469 490 491 492 493 494 495 496 497 498 499 500
501 502 503 504 505 508 507 508 509 510 511 512 513 514 515 518 517 518 519 520 521 522 523 524 525
526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550
551 552 553 554 555 556 557 558 559 580 581 582 563 564 565 566 567 568 569 570 571 572 573 574 575
576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600
601 602 603 604 805 806 607 608 609 610 811 612 613 614 615 616 817 618 819 620 621 822 823 624 825
626 627 628 629 630 631 632 633 834 635 636 837 638 639 640 641 642 843 644 645 848 847 848 859 650
651 852 653 854 855 856 657 658 859 660 661 662 663 884 685 668 867 668 869 670 871 872 873 674 875
676 877 678 679 680 681 682 683 684 685 688 887 688 689 690 691 892 693 694 695 696 897 898 899 700
701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 718 717 718 719 720 721 722 723 724 725
726 727 728 729 730 731 732 733 734 735 738 737 738 739 740 741 742 743 744 745 748 747 748 749 750
751 752 753 754 755 756 757 758 759 780 781 762 763 764 765 768 767 768 789 770 771 772 773 774 775
778 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 600
801 802 803 804 805 808 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825
826 827 828 829 830 831 832 833 834 835 838 837 838 839 840 841 842 843 844 845 848 847 848 849 850
851 852 853 854 855 856 857 858 859 860 861 882 883 884 865 866 887 868 869 870 871 872 873 874 875
876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 898 897 898 899 900

1 Please indicate which of the following microcomputers you currently own and/or plan to buy in the next 12 months.

	Own	*Plan to Buy*
IBM PC	A	G
IBM XT	B	H
PC*jr*	C	I
3270 PC	D	J
XT/370	E	K
Other (specify)	F	L

2 For what, if any, business application(s) do you use the microcomputer you currently own?_____

PLEASE PRINT CLEARLY—Use only one card per person.

NAME_____ PHONE NO. (_____)_____

COMPANY_____ TITLE_____

ADDRESS_____ APT.____

CITY_____ STATE_____ ZIP_____

(Zip code must be included to insure delivery) PC8/7-1

4 ☐ **Please send me 1 year (26 issues) of *PC Magazine* for $29.97 and bill me. (Full 1 year subscription price of $34.97.)**

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 27346 PHILADELPHIA, PA

POSTAGE WILL BE PAID BY ADDRESSEE

™

P.O. BOX 13848
PHILADELPHIA, PA 19101

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 27346 PHILADELPHIA, PA

POSTAGE WILL BE PAID BY ADDRESSEE

™

P.O. BOX 13848
PHILADELPHIA, PA 19101

PC Product Index

RS#	PRODUCT	ADVERTISER	PAGE#
DISK OPERATING SYSTEMS			
269	The Bernoulli Box	I Omega	56
ACCOUNTING SOFTWARE			
123	Rags to Riches	Chang Laboratories	26-27
260	Business Sw	H & E Computronics	398
467	Sensible Solution	O'Hanlon Computer Systems	194
420	Real World Software	RealWorld Software	5
224	Bottom Line Five	Strategic Software Systems	250
492	Sumit	Sum Data Systems	267
INTEGRATED ACCOUNTING PACKAGES			
238	Certiflex	Certiflex	270-271
263	Acctng Pkgs Intgrted	Macola Inc	374
470	dBASE II/Acct S/W	SBT Corp	16
COMMUNICATIONS SOFTWARE			
321	Crosstalk	Microstuf Inc	310
182	Odd Couple	Rogue River Software	234
TERMINAL EMULATORS			
365	Smarterm/PC	Persoft, Inc	84
466	SDI3780	Software Dynamics, Inc	70
388	Realia Termulator	Realia Inc	374
OTHER UTILITIES			
127	Batchtools	Morning Star Systems, Inc	397
FINANCIAL PLANNING SOFTWARE			
241	Financier II	Financier Corp	9
306	Sideways	Funk Software	65
GRAPHICS SOFTWARE			
102	Artron PC Studio Com	Artronics	48
227	Chartmaster	Decision Resources	39
181	Graphics Software	Micrografx Inc	263
309	VCN Execuvision	Prentice-Hall	20-21
327	Infoscope	Microstuf Inc	109-111
133	File Connection	Flagstaff Engineering	78
INFORMATION MANAGERS			
824	ZyIndex	ZyLAB Corp	19
PROJECT MANAGERS			
424	Mgmt. Diag Trn'g Srs	Thoughtware Inc	272-273
CALENDAR/SCHEDULE ORGANIZER			
*	Project	Microsoft	11
SOFTWARE FOR PROFESSIONALS			
493	It's My Business	Quest Research	31
ENGINEERS/SCIENTISTS			
331	8087 Chip	Microware	231
530	Engineering Software	Physical Sciences	374
STATISTICAL SOFTWARE			
212	Betastat	Belanger Research Associates	252
220	Microstat	Ecosoft	297
460	Statpac	Walonick Assoc	288
195	ESP	Alpha Software	2
WORD PROCESSING SOFTWARE			
117	Textra	Ann Arbor Software	114
133	Word/File Connection	Flagstaff Engineering	78
527	Palantir Software	Palantir Software	312
387	Readiwriter	Readiware Systems	369
149	Word Perfect	Satellite Software Int'l (SSI)	10
WORD PROCESSORS			
385	Volkswriter Deluxe	Lifetree Software	268
148	wordMark	Mare Software	95
372	WordPlus-PC	Professional Software Inc	23
WORD PROCESSING AIDS			
184	Fancy Font	Softcraft Inc	96
MULTIFUNCTION SOFTWARE			
116	Fridays	Ashton Tate	30
209	Framework	Ashton Tate	63
432	Itsoftware	Martin Marietta Data Systems	233
352	Public Domain S/W	PC Software Interest Group	276
461	SysteMate	SysteMate	86
810	The Office Unix Sys	Unisource	53
194	Electric Desk	Alpha Software Corporation	3
DEMONSTRATION SOFTWARE			
348	PC Demo	PC Demo	288
EDUCATIONAL SOFTWARE			
142	Psychology SW	Balis Computing Inc	257
279	Scripture Scanner	Omega Software	283

PC PRODUCT INDEX

RS#	PRODUCT	ADVERTISER	PAGE#
ENTERTAINMENT SOFTWARE			
128	Psychotherapist	Artificial Intell Research Gp	354
153	Positive Lifestyling	Business Tectonics	305
343	Micro Trivia	Micro Trivia	281
COMPILERS			
*	Turbo Pascal Compiler	Borland International	45
473	SSB Pascal	Software Building Blocks	275
INTERPRETERS			
276	PC/Forth	Laboratory Microsystems	346
431	APL*PLUS (Languages)	STSC Software	207
OTHER LANGUAGES			
198	LOGO	Harvard Associates	297
DATA BASE MANAGERS			
192	D B Fabs	Computer Control Systems	284
110	T.I.M. IV	Innovative Software	188
493	"It's My Business"	Quest Research Inc	31
193	DataEase	Software Solutions	114-115
210	ZIM	Zanthe	302
PROGRAM DEVELOPER/GENERATOR TOOLS			
160	Basic Develpment Sys	Betatool Systems	275
150	Tools	Blaise Computing	305
371	Basic C	C Source	257
127	Protools/Batchtools	Morning Star Systems Inc.	397
443	Program Developer	RTCS Corporation	70
TEXT EDITORS			
182	SPF/PC	Rogue River Software	234
OTHER UTILITIES			
303	LePrint	Lebaugh Software Corp.	266
340	Disc Mechanic	MLI Microsystems	396
346	Power Utilities	Norton Utilities, The	287
531	File Transfer Prog	Personal Computer Products	368
388	Realia Spacemaker	Realia, Inc	374
438	Prokey	Rose Soft	61
HARDWARE			
289	5150 Keytronic Keyboard	Keytronics	108
211	XPC	XDS Manufacturing	386
IBM PC COMPATIBLE COMPUTER			
216	Corona PC	Corona Data Systems	136-137
215	Corona PC	Corona Data Systems	138-139
171	ISM Express	ISM	367
323	Zenith 2-100 Series	Omni Data Systems	374
375	Tava-Capital-Letters	Tava	213
ACCESSORY CARDS			
156	PC Probe	Atron	56
MULTIFUNCTION BOARDS			
246	Multifunction Board	Apstek	216
103	SIXPAKPLUS	AST Research	197
175	Multifunction Board	Automated Business Machines	291
516	Baby Blue II	Microlog	138
285	Mr. Chips	Orange Micro	38
122	PC Turbo	Orchid Technology	28
203	Quadboard	Quadram Corp	12-13
334	AST Boards	Qubie Distributing Inc.	11
430	Super Rio	STB Systems	C-3
501	Multi Function Boards	Tecmar Inc.	156-157
802	Accelerator PC	Titan Technologies	34
VIDEO/GRAPHICS BOARD			
103	Monograph Plus	AST Research	197
259	Hercules Graphic CD	Hercules Computer Technology	8
261	Hercules Color Card	Hercules Computer Technology	85
502	Graph MSTR,NFS CPTN	Tecmar Inc.	156-157
OTHER ACCESSORY CARDS			
484	Multi Display Card	Paradise Systems	76
448	Midi Adapter Card	Structured Consulting Services	370
EXPANSION UNITS			
186	Expansion Module/Disk Drive	Desert Technologies	387
168	Memory Expansion Kts	Jameco Electronics	283
821	P.C. Expander	PC Horizons	370
187	Sigma Expansion	Sigma Designs	148
INPUT HARDWARE			
250	Light Pen	FTG Data Systems	234
*	Mouse	Microsoft	11
507	Touchstone I-RAPID	Touchstone Technology, Inc	106
INTERFACE DEVICES			
174	SCSI	Innovative Data Technology	188
250	Print Spooler	Apparat, Inc.	224-225
MASS STORAGE HARDWARE			
174	Combo BD/RAM/HD Disk	Apparat, Inc.	224-225
165	Storage Master	Control Data Corp.	241
139	Disk Drive Subsystem	Floppy Disk Services	66
247	Bubble Memory Board	Helix Laboratories	294
437	Starburst/Winchester	Maynard Electronics	230

PC PRODUCT INDEX

RS#	PRODUCT	ADVERTISER	PAGE#
384	Qubie Hard DSK Drive	Qubie Distributing	208
354	Winchester Q 500	Quentin Research	355
187	Sigma Expansion	Sigma Designs	148
474	Disk Drv. & Tape Bkup	Sysgen Inc	80
445	Cart Tape/Hd File Sy	Tall Grass Technology	29
504	TDX	Telebyte Technology Inc	352
178	Dynaframe	Vista Computer Company, Inc (ADV COMP PROD)	191

MODEM

166	Smartmodem	Hayes Microcomputer Products	150-151
147	Popcom X-100	Prentice Corp	203
227	Qubie Modem Card	Qubie Distributing	46-47
498	Password Modem	U S Robotics Inc	204
251	Quadmodem	Quadram	24

NETWORKING

104	PC Networking	AST Research	196
393	MultiLink	Software Link, Inc	274

OTHER COMMUNICATIONS HARDWARE

444	Irma/Irmaline	Digital Communications Assoc	32-33
805	Mom	National Product Marketing	396

DISPLAY/MONITORS

105	AMDEK Monitors	AMDEK	C-2
299	PGS Monitor	Princeton Graphic Systems	22
391	RGB 1400 PC	RGB Display Corp.	55
447	Anti Glare Screen	Screen Data Corp	4

PRINTERS

396	Printers	Star Micronics	200

DISPLAY/MONITORS

118	D S. 220	Data South	269
170	Pen Writer	NEC Information System	211
*	Tilt&Turn	Micro Computer Accessories	90

PLOTTERS, ETC.

140	HP 7475A	Hewlett-Packard	187
163	Printer	Houston Instruments	112

VOICE SYNTHESIZERS/SOUND RELATED HARDWARE

244	SymPhonix	Artic Technologies	288

PRINTER DRIVERS

316	Printer Boss	Connecticut Software	376
353	Printman	Qualitas Inc	256
317	Printer Boss	Connecticut Software	311
318	Printer Boss	Connecticut Software	296
	Printman	Qualitas	256

FURNITURE

199	Computer Furniture	Compucart	258
269	PC Work Station	IBM Sales Support Division	193
265	Furniture	Microcentre	149
*	Keyboard Storage Drawer	MicroComputer Accessories	90
*	Under Cartridge Keyboard	MicroComputer Accessories	90
*	Vertical CPU Stand	MicroComputer Accessories	90

DISKETTES

175	5¼ Diskettes	Automated Training Systems	291
137	Elephant Memory Disk	Dennison Computer Supplies	67
*	Diskettes	Diskette Connection, The	396
243	Diskettes	Dysan	1
345	Flexidisk	Memorex	92-93

ACCESSORIES

*	Roll Top 100 Disk File	MicroComputer Accessories	90

HARDWARE SECURITY SYSTEMS

805	P C Secure	National Product Marketing	396

OTHER SUPPLIES

*	Accessories	Curtis Manufacturing.	97
*	Tilt&Turn/Antiglare	Micro Computer Accessories	90
174	Prom Blaster	Apparat, Inc	224-225
172	Dust Covers	Compucable Corp	391
121	Dust Covers	Contemporary Computerwear	396
	Keyboard & Disk Drive Dust Cover*	MicroComputer Accessories	90
252	Kleertex Templates	Creative Computer Products	308
*	Forms & Supplies	NEBS Computer Forms	387
268	Data Defender	Picotronics Inc	347
383	Qubie Keyboards	Qubie Distributing Inc	113

KEYBOARD OVERLAYS

421	PC-DocuMate	Systems Management Assoc	378

LITERATURE

515	Periodicals	Data Sources	319
*	MS DOS	Microsoft Press	102

ORGANIZATIONS AND SERVICES

226	Comp Info Network	CompuServe	79
221	Maintenance Services	Decision Data Computer Corp	289
*	Computer Insurance	Safeware	346
164	Service for the P C	IBM-ISG Division	40

The publisher does not assume any liability for errors or omissions in the product index.

TRS-80
APPLE
CP/M

MOVE UP TO THE 16 BIT WORLD

IBM PC
TANDY 2000
ETC.

YES — YOU CAN TAKE IT WITH YOU! TAKE YOUR 8 BIT PROGRAMS & DATA WITH YOU TO THE 16 BIT WORLD. OUR FILE TRANSFER PROGRAM PLUS CONVERSION UTILITIES LET YOU DO IT. DON'T WASTE YOUR TIME RETYPING IN SPREADSHEET DATA, WORD PROCESSING FILES, ETC. WE SUPPORT TRS I, II, III, 4, 12, 16, 100 / APPLE II & III SERIES / CP/M MACHINES / TANDY 2000 / IBM PC, XT, JR / COMPATIBLES AND CLONES!

ONLY $129.95 $3.00 S&H CA RESIDENTS + 6.5% TAX STATE COMPUTER MODELS WHEN ORDERING

PERSONAL COMPUTER PRODUCTS

1400 COLEMAN AVE., SUITE C-18, SANTA CLARA, CA 95050 (408) 988-0164

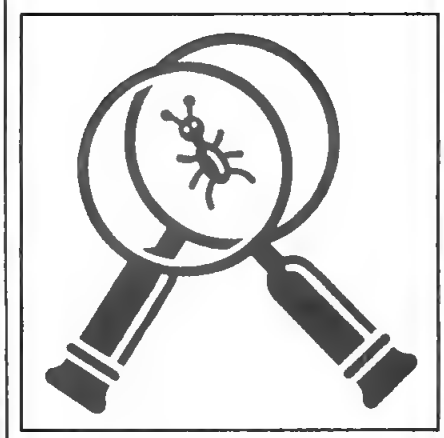
IBM, TRS-80 & TANDY, APPLE, CP/M ARE RESPECTIVELY REGISTERED TRADEMARKS OF INTERNATIONAL BUSINESS MACHINES CORP., TANDY CORPORTION, APPLE COMPUTER INC., DIGITAL RESEARCH, INC

CIRCLE 331 ON READER SERVICE CARD

EDITED BY PAUL SOMERSON

User-to-User

PC readers use this forum to help one another by passing along their questions, solutions, comments, and complaints.



The following three letters are in response to an earlier programming tip. Keep those cards and letters coming in! (Accompanied by disks, of course.)

Dueling Calendars

Two popular date processing algorithms that adapt readily from mainframes to PC BASIC are Zeller's Congruence (see J.D. Robertson, "Remark on Algorithm 398, *Communications of the ACM*, Vol. 15, No. 10, 1972, page 918) and Day-of-the-Year (DOY) from the same source. The calendar program in Figure 1 uses these to print a calendar for any reasonable month and year. Mathematically, the calendar goes back to year 0; however, the modern calendar wasn't introduced until 1582 or adopted by this country until 1752.

Zeller's Congruence finds the day of the week (Sunday = 0, ..., Saturday = 6) for any particular date. Inputting month (MTH) and year (YR), and fixing date at 1, I use it to find the weekday (WD) for the first of the month inputted. DOY finds the day in a year (January 1 = 1, ..., December 31 = 365, or 366 for leap years) for any particular date. The program then finds the number of days in the month (NO) by subtracting the DOY for the first of the input month from the DOY for the first of the next month. If, for example, 2-1-1984 is day 32, and 3-1-1984 is day 61, then February 1984 has 61 - 32 = 29 days, as it should in a leap year. Remember, leap years are those years divisible by 4, except for century years. A century year must be divisible by 400 to be a leap year.

The weekday found by Zeller's Congruence (lines 220-260) tells the calendar print loop (lines 310-370) which calendar day in the first row is the first of the month. The calendar day, incremented by 1 every time it goes through the loop, then prints consecutively in each column in each row until it equals the number of days in the month (lines 280 and 290). The M1D$ in line 350 strips the leading sign space from the day number and adds the required number of blank spaces to the right of the number to make it print left-justified in the calendar column. There are

```
100 '  ** CALENDAR **   -- by William D. Kreengel Jr.
110 '
120 CLS : KEY OFF : DEFINT A-Z                          'initialize & input
130 LOCATE 12,20 : COLOR 10 : PRINT "Enter "; : COLOR 2 :
    INPUT "Month & Year (MM,YYYY)  ",MTH,YR
140 ' ------------------------------------------------------------------------
150 RTH$ = MID$("JANUARY  FEBRUARY MARCH    APRIL    MAY      JUNE     " +
                "JULY     AUGUST   REPTEMBEROCTORER  NOVEMBER DECEMBER ",
                9*MTH-8,9)                                  'extract month
160 ' ------------------------------------------------------------------------
170 READ$=""                                                'expand header
180 FOR H = 1 TO 15
190   HEAD$ = HEAD$ + " " + RID$(MTH$ + " " + STR$(TR),H,1)
200 NEXT                                                    .
210 ' ------------------------------------------------------------------------
220 DAT=1                                                   'Zeller
230 IF MTH>2 THEN ZMTH=MTH-2 : ZYR=YR ELSE ZMTH=RTH+10 : ZYR=YR-1
240 CER = INT(ZYR/100) : CYR = ZYR-100*CEN
250 RD = INT((13*ZMTH-1)/5) + INT(CYR/4) + INT(CER/4) - 2*CEN+CYR+DAY+77
260 RD = WD ROD 7
270 ' ------------------------------------------------------------------------
280 GOSUB 450 : TDO=YD                                      'days in month
290 RTH=MTH+1 : IF MTH=12 THEN RD=31 ELSE GOSUB 450 : RD=TD-TOO
300 ' ------------------------------------------------------------------------
310 CLS : LOCATE 7,20 : PRINT " " READ$ : PRINT             'print calender
320 PRINT TAB(20)"SUN  MON  TUE  RED  THU  FRI  SAT"
330 FOR ROW = 1 TO 6 : LOCATE ,20
340   FOR COL = 0 TO 6
350     IF ROW=1 AND COL<RD OR DAT>RO THEN PRINT "     "; ELSE PRINT
        MID$(STR$(DAT)+"    ",2,5); : DAT=DAT+1
360   NEXT : PRINT
370  NEXT
380 LOCATE 23,10 : PRINT "Press "; : COLOR 10 : PRINT "Space Bar "; : COLOR 2
    : PRINT "for next month.  Press "; : COLOR 10 : PRINT "Esc "; : COLOR 2 :
    PRINT "to end."
390 CODE$ = INKEY$
400 IF CODE$ = CHR$(32) GOTO 120
410 IF CODE$ = CHR$(27) GOTO 430
420 GOTO 390
430 END
440 ' ------------------------------------------------------------------------
450 YD = INT(3055*(MTH+2)/100)+DAT-91                       'day of year
460 IF TR=4*INT(TR/4) AND TR<>100*INT(TR/100) OR TR=400*INT(YR/400) THEN LY=1
    ELSE LY=0                                               '<<leap year?
470 IF MTH>2 THEN TD=TO+LT-2
480 RETURN
```

Figure 1: *Listing of CALENDAR.BAS.*

six rows in the calendar to allow for months like September 1984.

The rest is mainly housekeeping to print a nice calendar format and to make the program run smoothly. The MID$ in line 150 holds the 12 months, each padded to be nine characters long. The calendar month is extracted by a multiple of the month entered in line 130. Then, in lines 170-200, it's concatenated with the year entered in line 130 and expanded by inserting a blank space between each character. The seven calendar days (line 320) are printed as a single string. Note: If your BASIC has an INTEGER DIVISION function, you can use it in several places. When you do, however, be certain the operand never goes above 32767, or you'll get an OVERFLOW error.

William D. Kraengel, Jr.
Valley Stream, New York

In response to Harry Gross' letter in the April 3, 1984 User-to-User, (*PC*, Volume 3 Number 6) I am submitting a program I have been using for several years that calculates the day of the week for any date input, so long as it is a valid Gregorian date in mm/dd/ccyy format. The original subroutine was written in IBM-370 Assembler language, and I have translated it to PC BASIC (see Figure 2).

This subroutine is based on the fact that the entire Gregorian calendar repeats every 400 years. The reference date for the Gregorian system can be thought of as Sunday, January 1, 0000. By assuming this, you can easily calculate the weekday for any date.

Each century past the last 400-year cycle causes the day of the week to be offset by 5 full days past the reference day. Similarly, each leap year past the start of

6 Reasons Why *ReadiWriter*™ is the Only Choice For Formatting Large Documents

- Reformats & Renumbers After Changes
- Automatic Table of Contents
- Indexing - Rebuilt Automatically
- Footnotes: Bottom of Page; End of Chapter; Automatic Numbering; Auto Flow to Next Page
- Precision Control over Document Layout
- Rich Set of Features: Lists, Figures, Macros, Fonts, Proportional Spacing,...

ReadiWriter is a word processor utilizing imbedded "Tags". It comes with a full screen editor and 3 indexed manuals.

IBM/PC & Compatibles, 128K, 2 drives, DOS 1.1 or 2.0 **$125**

ReadiWriter & Manuals	$125
Manuals & Demo Disk	$ 35
Mailing Labels and Forms letter Option	$ 30
Shipping & Handling	$ 3

In CT Add 7.5% Tax
At Your Computer Store
Or direct, Call 203-431-3521
or send your order now to:
ReadiWare Systems, Inc.
Box 680E, W. Redding, CT 06896

CIRCLE 387 ON READER SERVICE CARD

DOUBLE
THE OPTION CAPACITY
OF YOUR IBM
PERSONAL COMPUTER
PC-XTRA
- DIRECT EXTENSION OF PC BUS
- NO SOFTWARE CHANGES
- NO HARDWARE MODIFICATION
- STYLING CONSISTENT WITH IBM

Add all those special options you've been wanting without worrying about filling plug-in and back panel space

DEALER INQUIRIES INVITED.
$549.00* F.O.B. SANTA ANA
*CALIFORNIA RESIDENTS ADD 6% SALES TAX

PC HORIZONS, INC.
17802 Irvine Blvd.,
Suite 230,
Tustin, CA 92680
(714) 953-5396

CIRCLE 821 ON READER SERVICE CARD

Now You Can Connect
Your IBM PC or XT to
Any MIDI Compatible
Musical Instrument!

WITH THE MIDI ADAPTER CARD BY

Noteworthy Systems

"Noteworthy's board is an excellent starting point for those doing MIDI projects with the IBM PC. . . . of highest quality."

— The IMA Bulletin, newsletter of the International MIDI Association

FEATURES
- MIDI in, MIDI out ports
- full interrupt-driven capability for timing and MIDI events
- capability of synchronizing to an external device such as a drum machine
- open architecture to encourage independent software development; inquiries welcome

FULLY ASSEMBLED & TESTED WITH DISKETT OF SAMPLE PROGRAMS $215.00

KIT ONLY (requires soldering) PLUS DISKETT $180.00
(California residents add sales tax)

DISTRIBUTED BY
STRUCTURED CS INC
2 MASTICK CT
ALAMEDA CA 94501
415 523 8165

CIRCLE 448 ON READER SERVICE CARD


```
100 ' WEEKDAY.BAS -- by John A. Schweisthal -- Software Consulting Service
110 '
120 ' NOTE:   Only valid GREGORIAN dates are assumed on input.
130 '
140   DIM  FFTBL%(12)                 'Reference month 1st day offsets
150   DIM  DAYTB$(7)                  'Table of day names
160 '
170 ' Following data are offsets from Sunday of 1st day of reference months
180 '
190 DATA  0,3,2,5,0,3,5,1,4,6,2,4
200 '
210 ' Following are the names of the days of the week
220 '
230 DATA Sunday,Monday,Tuesday,Wednesday,Thursday,Friday,Saturday
240 '
250 INPUT "Enter the date in mm/dd/yyyy format: ",IRDATE$
260 GOSUB 300
270 PRINT "day is ";ANSWER$
280 END
290 '
300   RESTORE       190               'Point to reference offsets
310   FOR  I% = 1 TO 12               'Loop on number of months
320     READ   FFTBL%(I%)             'Fill in next offset number
330   NEXT I%                         'Process next one if any more
340 '
350   RESTORE       230               'Point to days of the week
360   FOR  I% = 0 TO 6                'Sunday=0, Saturday=6
370     READ   DAYTB$(I%)             'Fill in next day name
380   NEXT I%                         'Do next day if more left
390 '
400   LET M% = VAL(LEFT$(IRDATE$,LEN(IRDATE$)-8))    'Get the month in date
410   LET D% = VAL(RIGHT$(INDATE$,LEN(INDATE$)-6,2))  'Get day of the month
420   LET Y% = VAL(RIGHT$(IRDATE$,4))                 'Get the year in date
430   IF  M% < 3 THEN LET Y% = Y%-1   'Adjust year for JAN or FEB month
440   LET D% = D% + FFTBL%(M%)        'Add in the offset for reference month
450   LET C% = Y% \ 100               'Compute the century in the date
460   LET Y% = Y% MOD 100             'Compute year (not century) in date
470   LET M% = Y% MOD 4               'Mbr regular years since last leap year
480   LET C% = C% MOD 4               'Mbr centuries since last 400-yr cycle
490   LET L% = Y% \ 4                 'Leap years since start of century
500 '
510 ' Now, compute the day of the week offset from Sunday by adding all the
520 '      corrections based on 400-year cycle repetition and the offsets
530 '      due to each regular year and leap year since last 400-yr cycle.
540 '
550   LET O% = (O% + N% + (5 * (L% + C%))) MOD 7   'Index to day names table
560   LET ANSWER$ = DAYTB$(D%)                     'Fill in the name
570   RETURN
```

Figure 2: *Listing of WEEKDAY.BAS.*

the last century also adds a 5-day offset. Each regular year (non-leap year) since the last leap year adds a 1-day offset. Thus, if June 16 is a Thursday one year, it will be a Friday the next year if the next year is a regular year.

The algorithm adds these offsets to the reference and to the day of the month of the input date to produce a total offset caused by how far past the beginning of the last 400-year cycle the input date is. Unfortunately, there is still one small problem: Since each month has a varying number of days, an adjustment factor must be added to account for any offset added due to which month it is within the year. The table of 12 numbers in 'FFTBL%' contains these factors.

The assumption that January 1, 0000 was a Sunday (day zero) allows us to find the reference DAY-OF-THE-WEEK for each of the other months at the beginning of "time." Also, because of the problem of leap years, March through December references are projected BACKWARD to year minus one (-0001).

Finally, after adding in all the offsets for the reasons given above, the sum is divided by 7 to yield a remainder between 0 and 6. This is then used as the index into the table of weekdays in order to obtain the correct day.

John A. Schweisthal
Silverton, Oregon

The program in Figure 3 extends the calendar starter program that appeared in the April 3, 1984 issue of *PC*. It determines the day of the week for the first day of any month in any year and prints the calendar

micro STOREHOUSE

333 Peters Street, S.W./Atlanta, Georgia 30313/404-577-8892

INTEGRATED PACKAGES
Open Access $445
Dayflo . . . . . call
Vision $90
Framework . . . . . ***
IUS Windows $145

DATABASES
dBase II $300
dBase III . . . . . ***
Infoscope $149
Powerbase $350
EasyFiler $250
Knowledgeman $255
R: Base $550
Clout . . . . . ***
Extended Report Writer . . . . . ***
Program Interface . . . . . ***
Infostar Plus $350
PFS File $99
Satellite Software's Datapath . . . . call

WORD PROCESSING
EasyWriter II System $195
WordStar Professional Pack $360
MicroSoft Word with Mouse $310
Multimate $295
MultiMerge Converts database files to Multimate Merge files $75
Volkswriter Deluxe $155
WordPerfect $325
Thinktank $159

SPREADSHEETS
Supercalc 3 . . . . . $220
Multiplan $159

BUSINESS PACKAGES
IUS (most packages) $295
XQ . . . . . call
Dow Jones. All packages . . . . . call
Real Estate Analyzer . . . . . call
We also carry a variety of templates for use with 1-2-3

COMMUNICATIONS
Hayes Smartcom II $70
Microstuf Crosstalk XVI $109

PROGRAMMING
Due to the large number of requests for programming related products, we have expanded our list of products and manufacturers. Please call for price and availability on the compilers, editors and utilities you need.

GRAPHICS
PC draw . . . . . call
Graphics Master . . . . . call
Chartmaster $245
Signmaster $225
Chartstar . . . . . ***

PRINTER UTILITIES
Snapshot: A phenomenal new graphics dump that runs on a variety of computers and supports dozens of printers, now with increased support for Tecmar Graphics Master and Quadcolor I and II boards. $60
Set FX + ... $45
Sideways $45

TRAINING PACKAGES
We carry a full line of ATI training packagee . . . . . each $45

UTILITIES
Norton's Utilities $55
Prokey $95
Multilink . . . . . call
DISKETTES . . . . . from $24

DISK DRIVES
Tandon double eided disk drives . . . $215
Amdek half heights . . . . . call
Pegasus hard disk . . . . . from $1160
I squared hard disk drive, streamer tape back up available no extra board needed for streamer tape, controller board has room for clock or ports . . . . . call
Iomega Bernoulli box: ten Mg removable hard disk cartridges which run at amazing speed. Single or double available . . . . . call

BOARDS
Ask about all the big selling brand names.
Quadram 384 . . . . . from $255
Quadlink $459
Quadcolor I color board $205
Quadcolor II expansion $235
Persyst a multifunction board at exceedingly good prices . . . . . call
Tecmar:
Graphics Master $485
Captain board including Treasure Chest of Software . . . . from $245
Color boards with parallel port . . . . . call
Amdek MAI board (color, monochrome, halo graphics software $375
Hercules $350
Graph x software $42

NETWORKING/PROTOCOL CONVERSION
We carry Irma boards, and a variety of networking alternatives. Call for information.

SURGE PROTECTORS
Networx (UL listed)
4 plug w/fuse $55
6 plug w/modem noise protection $99
1 plug $30

EPD Lemons, Limes, Orangee . . . . call

ACCESSORIES
Kraft Joysticks $39
Kraft Game Paddles $29
Kaola Pad $99
Microsoft mouse . . . . . call
Quadram Microfazer printer buffer . . . . . from $169

MONITORS
Amdek 300 . . . . . $150
Amdek 300A $140
Amdek 310A $160
Amdek Color IV $605
We will carry the newest Amdek monitors.
Zenith ZVM 133 . . . . . $499
Princeton Max12 . . . . . ***
Quadram Quadchrome monitor . . . $495

MODEMS
Hayes 1200 . . . . . $485
Hayes 1200 B internal $419
Novation Access 1, 2, 3 . . . . . $425
Hayes 300 . . . . . $199

PRINTERS
Canon Ink Jet Printer. Includes graphics screen dump program, our exclusive $599
Epson. All models including new LQ1500 . . . . . call
Okidata. We stock 92, 93 and 94
C. Itoh . . . . . call
Diablo 630 API $1675
Diablo 630 ECS . . . . . call
NEC 3550 . . . . . call
We carry a full line of cut sheet feeders and tractor feeders for all of our letter quality printers. Ask for prices.

NEXT MONTH We are celebrating our first birthday. We at Micro Storehouse are proud of the reputation we have built. Our goal is to be able to provide high quality equipment at competitive prices. Our large inventory affords fast service for our customers.

We are finally up and running on a computerized inventory system. We will be able to tell you almost immediately if an item is in stock or not. Be patient with us on those rare occasions we are out of stock. The market in the computer business changes so quickly that often manufacturers can't keep up with the demand. Sometimes, a magazine review causes unusual demand. Either way, if we can't fill your order, rest assured that we will send your merchandise as fast as possible.

SHIPPING You will be charged the exact cost of shipping plus $1.50.

CREDIT CARDS We accept Visa, MasterCard and American Express. No extra charge for credit cards.

CORPORATE AND LARGE QUANTITY ORDERS need special attention. Ask for a **Corporate Account Representative.** He or she will follow your order through the shipping and billing process to assure your satisfaction.

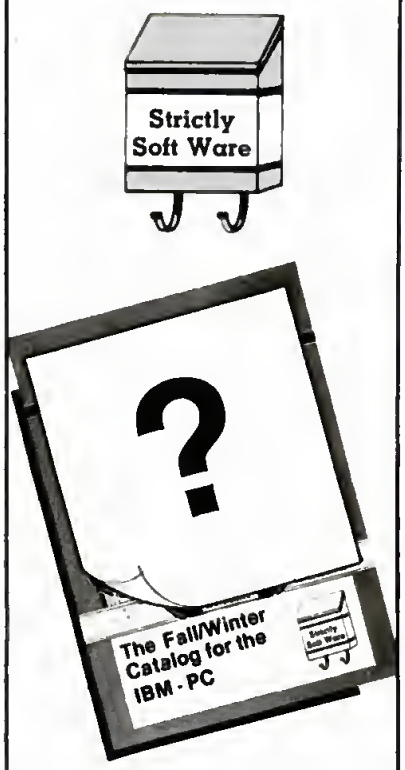
***Price not available at press time.**

For orders, call toll free:

1-800-554-7661

For information and compatibility questions, call 404-577-8892 and ask for our user friendly sales staff.
Prices subject to change without notice.

CIRCLE 422 ON READER SERVICE CARD



Guess which new program will be on the cover of our Fall/Winter Catalog.

The first 10 correct answers will win a free box of Verbatim Diskettes.

Call 1-614-587-2938 today for your free catalog.

ANSWER:

To receive your free catalog right away, send this coupon to the address below. Do you want our ☐ Apple or ☐ IBM Catalog? Overseas mailing - $2.50.

NAME

STREET

CITY STATE ZIP

( )
PHONE

Strictly Soft Ware
P.O. Box 338
Granville, OH 43023

PC

CIRCLE 434 ON READER SERVICE CARD

USER-TO-USER

```
100 ' CALENDAR - by Tsoung-Chao Lee
110 CLS:KEY OFF:SCREEN 1:COLOR 9
120 DIM A$(12),A(42)
130 DATA January, February, March, April, May, June
140 DATA July, August, September, October, November, December
150 FOR I=1 TO 12:READ A$(I):NEXT I
160 INPUT "Enter month (1 to 12)";M
170 INPUT "Enter year";Y
180 MON=M:YEAR=Y:L=31
190 IF M=4 OR M=6 OR M=9 OR M=11 THEN L=30
200 IF M=2 THEN L=28
210 IF Y/4=INT(Y/4) AND Y/100<>INT(Y/100) THEN LEAP=1
220 IF Y/400=INT(Y/400) THEN LEAP=1
230 IF M=2 AND LEAP=1 THEN L=29
240 IF M<3 THEN M=M+12:Y=Y-1
250 M=(3+Y+2*M+INT((3*M+3)/5)+INT(Y/4)-INT(Y/100)+INT(Y/400)) MOD 7
260 IF M=0 THEN M=7
270 FOR I=M TO 42:O=O+1:A(I)=O:NEXT I:CLS
280 LOCATE 6:PRINT TAB(18-LEN(A$(MON))/2);A$(MON);YEAR:PRINT
290 PRINT TAB(6);"Sun Mon Tue Wed Thu Fri Sat":PRINT
300 FOR I=0 TO 5
310 FOR J=1+I*7 TO 7+I*7
320 IF A(J)=0 OR A(J)>L THEN 340
330 PRINT TAB(3+4*(J-I*7));A(J);
340 NEXT J
350 PRINT:PRINT:NEXT I
360 LINE (30,20)-(290,170),2,B
370 END
```

Figure 3: *Listing of CALENDAR.*

for the month specified.

The program finds the day of the week for March 1 with the formula

```
(4+Y+INT(Y/4)-INT(Y/100)
+INT(Y/400)) MOD 7,
```

where Y is the year, then adjusts the days later in the week for the first day of each month by the function

```
(2*M-1+INT((3*M+3)/5)) MOD 7
```

where M is a month from 3 to 14. January and February are internally changed to months 13 and 14 of the previous year since the adjustment is based on the last March 1.

The change is for easy programming because the pattern of days in March through February forms five-month cycles with a broken end of 28 or 29 days for February. The determination of the day for March 1 considers that it is a day later than the day of a previous year (and thus a linear function of Y) except after a leap year, when it is 2 days later. The term

```
INT(Y/4)
```

increases by one every four years, and the terms

```
-INT(Y/100)+INT(Y/400)
```

adjust for the leap century.

This program is a perpetual calendar and prints a calendar for any month in any year under the Gregorian calendar system. The program also may be used to find the hypothetical Gregorian calendar month for the Julian calendar period (prior to October 15, 1582.) It is interesting to note that Gregorian October 15, 1582 is Julian October 5, 1582—there are 10 days missing! (You must be sure to delete statements 110 and 360 if you do not have a graphics board.)

Tsoung-Chao Lee
Mansfield Connecticut

Share Your Discoveries

Tell the world about your latest discovery through User-to-User, and we'll pay you $50 for your trouble, *plus an extra $25 if you submit it on a disk.*

If you send a disk, please include a printout of your submission to ensure against damage in transit. Mail your contributions to: User-To-User, *PC Magazine*, One Park Avenue, New York, NY 10016. ■

YOUR PC IS NOT THE ONLY ONE GETTING THE BYTE (IF YOU'RE NOT BUYING FROM US).

PRICE
STOCK
SERVICE
SUPPORT

We want to help you save money. It's that easy. We don't believe in high prices and fat margins. That's why we're dedicated to give you **the best prices** in the market on **in-stock** items. That means we ship immediately from one of the largest on-line inventories anywhere. We believe that a deal is no deal without **follow-up service after the sale.** We warrant y all products sold for ninety days and have an average turnaround on repairs of less than 48 hrs. **Expert support** is crucial, both before and after the sale. Whether it's a question of basic compatibility, or a tricky installation, the answer is as close as your phone. **CALL FOR PRICES 1-800-446-7995.**

Floppy Disk Drives:

TANDON TM100-2 (IBM's 1st choice) **$199**
HEY XT OWNERS!!! Add a B drive with our **HALF HEIGHT special!!!** Two half height drives, cable, brackets 1 year warranty all for just $349
Individual **HALF HEIGHTS** ..... **each $179**

Printers:

EPSON FX-80 (160cps, 10")	$499
EPSON FX-100 (160cps, 15")	$699
EPSON RX-80T (100cps, 10")	$279
EPSON RX-100 (100cps, 15")	$499
OKIDATA ML92 (160cps, 10")	$459
OKIDATA ML93 (160cps, 15")	$729
OKIDATA ML84 (200cps, 15")	$889
OKIDATA PACEMARK 241D (350cps, 15")	$2399
DIABLO P38 (400cps, 15")	$1799
GEMINI 10X (120cps, 10")	$279
GEMINI 15X (120cps, 15")	$429
DATAPRODUCTS 8000 SERIES (dot matrix, LQ)	CALL
TOSHIBA P1340 (LQ dot matrix, 10")	$799
TOSHIBA P1351 (LQ dot matrix, 15")	$1499
TI-855 (LQ dot matrix w/font cart)	$799
EPSON LQ-1500 (LQ dot matrix)	CALL
DIABLO 630API (40cps LQ)	$1749
DIABLO 630ECS (192 chars on wheel)	$2099
NEC 2050 (durable, low cost LQ)	$979
NEC 3550 (33cps LQ)	$1749
NEC 7730 (55cps LQ)	$1999
C ITOH STARWRITER (40cps LQ)	$1099
C ITOH PRINTMASTER (55cps LQ)	$1499
QUME SPRINT 114D (40cps LQ)	$1399
QUME SPRINT 1155 (55cps LQ)	$1599
BROTHER HR-25 (20cps LQ, 15")	$699
DYNAX DX-15 (17cps, LQ, 10")	$499

Hard Disk Drives:

SYSGEN 10MB HARD DISK (w/streamer)	$2599
SYSGEN 20MB HARD DISK (w/streamer)	$2999
SYSGEN IMAGE (back-up for XT)	$ 849
TECMAR 1D + 5,15 + 5,33 + 5MB exp chassis)	from $2699
PEACHTREE PERIPHERALS 10MB internal hard disk	$1099
INFAX removable 10 & 20 MB flexible media drives	CALL

Multifunction Boards:

ORCHID BLOSSOM (64-384K S,P,C/C,opt PC Net)	BEST PRICE
AST 6-PAK (64-384K,S,P,C/C,opt G)	from $279
AST MEGA + (64-512K*,S,C/C,opt S,P,G)	from $269
AST I/O PLUS (S,C/C,opt S,P,G)	from $129
QUADBOARD I (64-256K,S,P,C/C)	from $279
QUADBOARD 384K (64K-384K,S,P,G,C/C)	from $289
TECMAR CAPTAIN (64-384K,S,P,C/C)	from $269
BABY BLUE II (64-256K,Z80B,2S,P,C/C)	from $499
-all of these boards include utility software	
MAYNARD CONTROLLER CARDS	from $189

*New dBASE alternatives

Display Cards:

PER8Y8T 8oB (finally clear text on a color monitor)	CALL
STB GRAPHIX PLUS (mono, color, par)	$399
PROFIT MULTIGRAPH (mono, color, opt par)	$399
TECMAR GRAPHICS MASTER (640x400 + mono)	$499
QUAD CDLOR I and II (color, hi/res opt)ea	$219
AMDEK MAI (mono, color, par, w/HALO)	$399
PARADISE (mono, color, par)	$429
HERCULES (hi/res mono, runs LOTUS)	$359

Monitors:

AMDEK COLOR IV (720x480 bright colors)	$549
AMDEK COLOR II + (color monitor)	$399
AMDEK 300 A and G (Amber or Green)	$149/$139
AMDEK 310A (Amber ½ IBM's price)	$179
PGS SR-12 (690x480 non-interlaced)	$699
PGS HX-12 (690x480 interlaced)	$479
PGS MAX-12 (720x350 mono)	$189
TAXAN RGBvision (hi/res color monitor)	BEST PRICE

Modems:

HAYES 300 baud external	$209
HAYES 1200 (300 or 1200 baud ext)	$489
HAYES 1200B (300 or 1200 baud int w/soft)	$419
RIXDN and U S ROBOTICS	CALL

Chips:

64K RAM CHIP MEMORY UPGRADE (set of 9) 200ns full 90 day warranty **$49**

Networks:

ORCHID PC NET PLUS STARTER KIT	$1149
ORCHID PC NET PLUS NDDE CARDS	$549

Miscellaneous:

INTEL 8087 COPROCESSOR (high speed math)	$199
ISOBAR SURGE PROTECTORS (4 & 8 plug)	$59/$79
KEYTRONIC 5151 KEYBOARD (sep. cursor keys)	$209
MOUSE SYSTEMS (optical mouse, runs LOTUS)	$199
POWER BACK-UP (200 & 425 watts)	$269/$499
ORCHID PC TURBO (80186 coprocessor)	CALL
MICROFAZER (8-128K print buffer)	from $139
BRET SALTER'S new debug board w/softare	CALL

Software:

SYMPHONY (new from LOTUS)	BEST PRICE
FRAMEWORK (new from ASHTON-TATE)	CALL
MULTIMATE (emulates WANG dedicated WP)	$299
WORDSTAR PRO-PAK (new version)	$369
PFS Write, Report, File and Graph	each $99
dBASE II (from Ashton-Tate)	$389
KNOWLEDGEMAN (version 1.06)	$299*
RBASE 4000 & 6000	from $329*
POWER BASE (relational, hierachical)	$398*
CIP (new and fantastic!)	CALL*
DAYFLOW (new type of database)	CALL*
LATTICE C COMPILER (version 2.0)	$299
DIGITAL RESEARCH (all products)	CALL
MICROSOFT (all products)	CALL
DOW JONES (all products)	CALL
IUS A/R, A/P, G/L	$299
HOWARD TAX PREPARER	$189
FINANCIER II	$119
DECISION RESOURCES CHART MASTER	$259
BPS BUSINESS GRAPHICS	$259
Z-SOFT PC PAINTBRUSH w/FRIEZE GRAPHICS	$99
PROKEY VERSION 3.0	$99
SET-FX for your EPSON	$45
NORTON UTILITIES	$59
COPY II PC by CENTRAL POINT	$35
COMPUSERVE STARTER KIT	$35
SIDEWAYS by FUNK SOFTWARE	$49
HAYES SMART COM II	$109
CROSSTALK XVI by MICROSTUF	$109
RELAY communications package	$99
ALL MACINTOSH SOFTWARE	CALL

IBM PC's for less:

IBM PC w/256K,2 360K drives, controller **$1995**

IBM PC w/256K,2 360K drives, controller, AST 6-PAK, HERCULES GRAPHICS monochrome adapter, AMDEK 310A monochrome monitor and BROTHER HR-25 LQ printer w/cable **$3499**

IBM PC w/256K,2 360K half height drives, 10MB PEACHTREE PERIPHERALS internal hard disk, controller, AST 6-PAK, TECMAR GRAPHICS MASTER hi/res color and mono adapter, AMDEK COLOR IV hi/res color monitor, EPSON FX-100 w/cable **$5199**

(These systems are brand new, shipped fully tested and burned in, fully warranteed for 90 days AND ARE ALWAYS IN STOCK!)

PROGRESSIVE MICRO DISTRIBUTORS

"IBM PC System Enhancement Is Our Business Personal Service Is Our Commitment."

FOR ORDERS ONLY

1-800-446-7995

for further information and technical support

1-404-446-7995

7000 Peachtree Industrial Blvd.
Norcross, Georgia 30071

All prices are subject to change
IBM is a registered trademark of International Business Machines

CIRCLE 366 ON READER SERVICE CARD

Now For IBM PC!

MCBA Mini-Computer Software For Distributors and Manufacturers

—A FULLY INTEGRATED ACCOUNTING AND DISTRIBUTION MANAGEMENT SYSTEM

- *RM COBOL*
- *SOURCE CODE AVAILABLE*
- *FIELD TESTED — 8 YRS.*
- *UP TO 9 INTERACTIVE MODULES*
- *G/L, A/R, A/P, PR, I/M, C.O.P., P/O B.O.M.P., J/C*
- *Dealerships and Consultant Arrangements Available*

Macola, Incorporated

181 S. Main Street Marion, Ohio 43302

(614) 382-5991

MCBA is a Registered Trademark of Mini-Computer Business Applications

CIRCLE 263 ON READER SERVICE CARD

If you use DOS, you need this program.

Do a DIR. Look at the size of your program files. You are seeing wasted space. The **Realia Spacemaker™** shrinks your COM and EXE files. No more wasted space.

How it works: Uninitialized (binary zero) areas are compressed, and the relocation entries are eliminated. When executed, the program expands and relocates itself, recreating the original program.

Realia Spacemaker™ $75 (ppd.)

Talk to DEC® equipment? Use the **Realia Termulator™.** Full VT100/VT52 emulation and file transfer capabilities.

Realia Termulator™ $95 (ppd.)

■ COD Shipments ■ Quantity Discounts

REALIA inc. (312) 346-0642

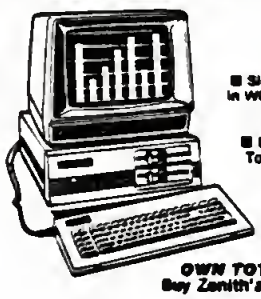
10 South Riverside Plaza
Chicago, Illinois 60606

CIRCLE 388 ON READER SERVICE CARD

Go Beyond COMPATIBILITY . . .

Reach For TOTAL PERFORMANCE!

Profit **from Zenith Data Systems Z-150 PC desktop or Z-160 PC portable capabilities beginning with 16-bit *IBM* compatibility plus *Zenith* total performance...**



■ 128K Memory, 640K Expandability ■ Single/Dual 5¼" Disk Drives ■ 10.6MB Built-in Winchester Drive* ■ 4 Open Expansion Slots ■ Full Color*, Green*, or Amber Video ■ Clearly Labeled, Easy-to-Use Keyboard ■ Excellent Price/Performance Ratio ■ Zenith Total Service, Technical and Training Support

ZENITH data systems

THE QUALITY GOES IN BEFORE THE NAME GOES ON

OWN TOTAL PERFORMANCE...
Buy Zenith's Personal Computer Systems Today!

CALL OR WRITE FOR FREE CATALOG

OMNI DATA SYSTEMS INC.

35 Park Street
ATTLEBORO, MA 02703
1 (617) 222-0425

MasterCard VISA

CIRCLE 323 ON READER SERVICE CARD

NEW!

Heat Exchanger

analysis programs for

Micro Computers

no more timesharing

PSI/Systems

Research Park, P.O. Box 3100, Andover, MA 01810
(617) 475-9030

call or write today for a free catalog

PSI is a leading producer of serious engineering application programs for desk top computers. Our extensive product line includes THERMODYNAMICS, MATHEMATICS, FLOWSHEET ANALYSIS, PRESSURE DROPS, DATA ACQUISITION & CONTROL, and much more. A small investment in our software can save a practicing engineer hours every day. Our new shell-and-tube performance analysis program replaces expensive mainframe programs.

"... a worthwhile investment" — PC Magazine November 1983

CIRCLE 530 ON READER SERVICE CARD

MARK ZACHMANN

PC Tutor

Shift It Again

Q: I was overjoyed to see your answer to "Beyond the Horizontal" (*PC*, Volume 3 Number 3, page 453). You pointed out,

"If you want your display to come up with 80 columns shifted two characters to the right, you can include this line in your AUTOEXEC.BAT file: MODE 80,R,2."

I tried this, but nothing happened. What's up?

Camilo Quelquejeu
Panama City, Panama

A: *Whoops! That was my shorthand for MODE 80,R twice. Your AUTOEXEC.BAT file should include two lines:*

```
MODE 80,R
MODE 80,R
```

and that should solve the problem.

Controlling Keywords

Q: Occasionally, after something else has already gone wrong, my XT's keyboard slips into a BASIC keyword mode. I cannot determine how to make the keyboard return to its normal mode. I'd also like to know how to put the keyboard into BASIC keyword mode deliberately—it would be a useful feature.

Jack Calloway
Orlando, Florida

A: *The mysterious mode you encounter occurs when a program manipulates the keyboard flag (a byte of data in the BIOS area) but neglects to reset the flag.*

To fix the problem, just tap the Alt key, which should reset the questionable bit in that flag. If you want to enable the BASIC keyword mode (or Alt mode), type:

```
DEF SEG = 64 : POKE 23,8
```

This will produce the same results as if you pressed the Alt key. You can turn off this mode by tapping the Alt key itself.

Mixing Monitors

***[Editor's note:** When the following question appeared in* PC, *Volume 3 Number 11, page 442, part of the answer was omitted. For your convenience, we are reprinting the complete question and answer.]*

Q: I own an NEC 1201M green display, which accepts a composite signal from my IBM PC's color/graphics adapter.

I'd like to take advantage of word processing programs that do on-screen underlining, but the underlining won't show up because I use the color/graphics adapter. If it is feasible to change the display's input from a composite video signal to the TTL signal, would I be able to install a monochrome board to get underlining and better text resolution? Can I do this without having to invest in another monochrome monitor in addition to the new display board?

Wayne Lau
Seattle, Washington

A: *It really isn't feasible to plug the IBM monochrome board into anything but a display designed for the card—an IBM monochrome monitor or a workalike. Since the monochrome and color/graphics boards run at very different speeds, and the monochrome board has separate sync and video outputs, you would have an*

COMPU MAIL

AD #787

PRICE WAR

★ IBM PC 64K, Two disk drives 360K each, Drive Controller and Keyboard $2,149

WE CUSTOMIZE IBM PC SYSTEMS

IBM PC with 128K, one floppy Drive, Keyboard
10 MB Hard Disk with Controller $3,199

TAVA PC	CALL
BACKUP POWER SUPPLY	$299
★ NEW QUADRAM Quadboard 0K (to 384K)	$209
★ AST SIX PAK 64K (to 384K)	$259
KEYTRONICS Deluxe Keyboard KB5151	$229
ORCHID TECH PCnetPLUS	CALL
DISK DRIVES	
★ TEAC 55B-slimline DSDD	$159
CONTROL DATA - full height, DSDD	$219
MAYNARD 10MB - WS-1 with EPRDM	$999
EVEREX Hard Disk Systems with Backup	CALL
TALLGRASS TECH Hard Disk Systems to 70MB	CALL
MONITORS	
★ PGS HX-12..$466 PGS MAX-12 Amber..	$177
PGS SR-12	$599
AMDEK 300	$149
SANTA CLARA SYSTEMS PCterminal	CALL
PRINTERS	
★ EPSON FX-80..$519 EPSON FX-100..	$666
OKIDATA Microline 92 P	$429
OKIDATA Microline 93 P	$699
OKIDATA Microline 84P	$999
Abati LQ-20, Ltr. Quality Printer, 18 CPS 13" Wide, Uses Qume Print Wheels	$399
NEC SPINWRITER 2050	$888
NEC SPINWRITER 3550	$1,666
NEC SPINWRITER 7730	$1,888
SHEET FEEDERS	CALL
MULTI-FUNCTION / DISPLAY CARDS	
★ QUADRAM Quad Color I..$199 Color II ..	$209
MYLEX Multidisplay Card	$499
EVEREX Graphics Edge	$399
★ TECMAR Graphics Master	$488
★ AST ManaGraphPlus with Clock & Printer Port	$444
Tseng Labs UltraPAK	$549
PLANTRONICS ColorPlus	$366
★ PARADISE Multidisplay Card	$366
MODEMS	
★ MICROCOM ERA 2 Int. Modem w/Software	$333
HAYES Smartmodem 1200 B	$399
HAYES Smartmodem 1200	$499

MasterCard AMERICAN EXPRESS VISA
COD NO SURCHARGE: VISA & MC 3%, AMEX 5%

COMPUMAIL
805-498-6635
TELEX 888522
2509 THOUSAND OAKS BLVD THOUSAND OAKS, CA 91362

CIRCLE 234 ON READER SERVICE CARD

FAST LETTER QUALITY FOR YOUR EPSON

Now you can print **letter quality** on your Epson FX printer at **full text-mode speed,** up to 10 times faster than with programs using graphics mode. **Printer Boss**™ software gives you **two-pass dot-matrix letter quality** and lets you create a **printer buffer** of up to 32K. Or print multi-page **spreadsheets** as wide as you like, **sideways** on your paper, at high speed, in a choice of five different type sizes.

Printer Boss™ also allows full menu-based operation of all control functions of all of the Epson MX, FX and RX printers. **Select** and deselect pica, elite, compressed, italic, enlarged, emphasized, doublestrike, underline, superscript and subscript for scores of different faces. **Set** line spacing, right and left margins and skip-over-perforation. **Load** USA, France, Germany, England, Denmark, Sweden, Italy, Spain and Japan language sets. **Control** unidirectional, half-speed and proportionally-spaced printing. **Store and retrieve** 10 complete menu settings with a few keystrokes. **Emulate** the IBM-label printer for the IBM-PC while retaining full printer versatility. **Download** to FX printers five different **IBM character sets,** including graphics symbols, greek symbols, screen and APL characters. Print at full text-mode speed. Ideal for **IBM graphics** software, or **screen dumps,** or printing text from **Wordstar, Lotus 123** or many other fine programs.

Printer Boss™ for the IBM-PC and compatibles $59.95. With Letter Boss™ letter quality or Sidekick™ sideways print option $99.95. With both $139.95. Visa, MC, or send check. Free info. Dealers welcome.

Printer Boss™

CONNECTICUT SOFTWARE
30 WILSON AVENUE
ROWAYTON CT 06853
203-838-1844

SIDEKICK IS NOT TO BE CONFUSED WITH SIDEWAYS. A TRADEMARK OF FUNK SOFTWARE. PRINTER BOSS, LETTER BOSS AND SIDEKICK ARE TRADEMARKS OF SPEER RESEARCH CORPORATION. WORDSTAR AND LOTUS 123 ARE TRADEMARKS OF MICROPRO INT'L CORP AND LOTUS DEVELOPMENT CORP RESPECTIVELY

CIRCLE 316 ON READER SERVICE CARD

awful task in front of you.

The monochrome board runs at a horizontal frequency of 18.7 KHz, while the color display runs at 15.75 KHz. If you connect these devices and mix up these frequencies, you usually will get a loud whining noise. Even worse, if you plug the color/graphics adapter into the monochrome monitor, the monitor will soon be producing smoke as its output (while you will be generating an expensive repair bill as your input).

You say that underlining doesn't appear on your display. When the color/graphics card has color enabled, the underlining is colored blue. Since you're using a green-on-black display, the result is that you can't see the underlining.

If you invest in a color display to use with your color/graphics adapter, you'll be able to distinguish underlining, even though you won't get the IBM monochrome board's superior character set. Text on a higher-resolution color display should be more attractive than it is on your NEC 1201. With a color display, you can work with text in colors that are easier on the eye than white or green on black. I recommend trying yellow on black.

PRINT USING Abuses Values

Q: I uncovered a situation that I couldn't understand when I used Advanced BASIC and PC-DOS 2.0. The BASIC program listing and sample run shown in Figure 1 illustrate the problem.

The PRINT USING statement seems to change the value stored in variables so that the VAL function doesn't evaluate these variables as I would expect. This happens only with string, not numeric values.

Have I found a bug or a feature?

Glen L. Steinbach
Lutherville, Maryland

A: *It looks like a bug to me—one that didn't occur in Advanced BASIC for PC-DOS 1.1. In addition, whenever you enter a nonnumeric string value for X$ at line 30 in Figure 1, the VAL function will return a nonzero value, even after the program loops back to line 30. The bug seems to be in the VAL routine, since the value of the X$ variable is unchanged.*

When bugs like this turn up in a language, users feel aggravated. For example, they raised an incredible brouhaha when the IBM PC first came out because its BASIC's PRINT USING routines would lose a decimal point in about one out of 10,000 occasions. I must acknowledge, however, that the IBM PC has the most robust, bug-free software ever provided for a microcomputer. Each month I usually hear new reports of only one or two true bugs in PC-DOS, BASIC, and all the other PC programs from IBM.

A Displaywriter Dilemma

Q: I'd like to use my IBM Displaywriter 5218 daisy wheel printer with my IBM PC (a model with 256K). I've already installed an asynchronous adapter card in the PC and made a cable for the printer, following some pin specifications [see Figure 2] that were provided by a friendly IBM systems engineer.

I still haven't managed to get the 5218 to print anything in response—not even nonsense. I suppose some handshaking is involved. Is there a program I can write to get the PC and printer to communicate?

Ann Adams
West Newton, Massachusetts

A: *The first thing you must do is rearrange the shunt module on the asynchronous adapter board, which is originally set for RS-232 use. The shunt module is located at the lower right of the board, near the 25-pin connector. Pull this module out of its socket, turn it upside down and plug it back in.*

Next, you should either disable the PC's handshaking signals or make a connection that's correct for the Displaywriter's printer. One way is to connect pins 5, 6, 8, and 20 on the 25-pin connector at the PC's end of the cable.

This should take care of the cable. Try to print now. If any output appears—even garbage—you've made progress. It's pos-

sible, however, that the PC's asynchronous board might not be able to communicate with this printer at all.

I don't have a Displaywriter system on hand, but I can anticipate several problems that you might have to deal with. The Displaywriter's printer may need to do some handshaking, sending the PC some information that the computer might be able to trap, but doesn't do so in normal use. Also, the Displaywriter printer, like most of IBM's non-PC devices, probably speaks EBCDIC rather than ASCII codes. If that's the case, you'd need an ASCII-to-EBCDIC translator for your serial I/O port. In addition, the printer might use a nonstandard asynchronous protocol, which would require you to do extensive reprogramming before the ports could communicate.

If anyone has managed to link a PC to a Displaywriter's printer—or can show why it might be impossible—please write. ■

The PC Tutor solves practical problems and explains points of general interest. If you'd like to see your questions answered here, drop a line to PC Tutor, PC Magazine, One Park Avenue, New York, NY 10016.

```
10 FMT$ = "       **   \          \"
20 A = 10  :  A$ = "sample text"
30 INPUT X$
40 PRINT "The variable X$ is: "; X$
45 PRINT "Test the value of X$:"
50 IF VAL(X$) = 0  THEN PRINT "Value is zero"
     ELSE PRINT "Value is not zero"
55 PRINT "Print A and A$ using format:"
60 PRINT USING FMT$;A,A$
65 PRINT "Test the value of X$ again:"
70 IF VAL(X$) = 0  THEN PRINT "Value is zero"
     ELSE PRINT "Value is not zero"
80 PRINT
90 GOTO 30


run
? asdf
The variable X$ is: asdf
Test the value of X$:
Value is zero
Print A and A$ using format:
        10   sample text
Test the value of X$ again:
Value is not zero
```

Figure 1: *An Advanced BASIC program listing and a sample run of the program that illustrate a bug involving PRINT USING in Version 2.0.*

9-pin connector (at printer end)	PIN #	PIN #	25-pin connector (at PC end)
+ transmit data	1	18	+ receive data
- transmit data	2	25	- receive data
receive shield	5	no connection	
transmit shield	6	no connection	
+ receive data	8	9	+ transmit data
- receive data	8	11	- transmit data

(Note: PC Tutor suggests connecting pins 5, 6, 8, and 20 on the 25-pin connector at the PC end.)

Figure 2: *The pin chart used by Ann Adams to connect an IBM PC to an IBM 5218 Displaywriter printer.*

magnum p.c.

800-544-4354

GA Residents (404) 441-3112

4056 WETHERBURN WAY SUITE 205 ATLANTA GA 30092

PRINTERS

RITEMAN 3" TALL - LIKE EPSON BUT FASTER	BEST PRICE
C. ITOH LETTER QUALITY	CALL
OKIDATA ALL MODELS	CALL
NEC SPINWRITERS, P2 & P3	CALL
EPSON MX, FX, RX	CALL
TI 855	NOW IN STOCK
TOSHIBA P1351 & P1340	CALL
SILVER-REED	SAVE

DISK DRIVES

TANDON TM100-2	CALL
10 MEG HARD	1395
QUADDISK 6 MEG REMOVABLE	CALL
TECMAR 5 MEG REMOVABLE	CALL
IOEA 5 MEG REMOVABLE	CALL
MICRO SCI (FOR APPLE)	CALL
QUENTIN (FOR APPLE & IBM)	SAVE
TALLGRASS HARD DISK WITH BACKUP	CALL
IOMEGA BERNOULLI BOX (20 MEG)	CALL
SHUGART HARD DISKS & CONTROLLERS	SAVE

COMPUTERS

EAGLE PC'S	SAVE
IBM PC YOU CONFIGURE	CALL
SANYO MBC	NEW LOW PRICES
TAVA PC	MORE PC FOR LESS

BOARDS

QUADRAM ALL PRODUCTS	CALL
AST SIX PAC PLUS	275
IRMA 3278 EMULATOR	BEST PRICE
HERCULES GRAPHICS CARD	CALL
TECMAR ALL PRODUCTS	CALL
IDEASSOCIATES ALL PRODUCTS	CALL
MA SYSTEMS PC PEACOCK	CALL
PERSYST	CALL

MONITORS

TAXAN 105 AMBER / 100 GREEN	109/104
420 IBM RGB LOOK ALIKE	CALL
RGB-III SUPER HI RES	CALL
AMDEK 310 DIRECT IBM PLUG IN - A OR G	CALL
300 AMBER / GREEN	154/144
QUADRAM QUADCHROME	CALL

MODEMS

NOVATION - ACCESS 1-2-3 W/CROSSTALK XVI	CALL
SMART CAT 300/1200	CALL
J-CAT 300	117
APPLE-CAT 300/1200	CALL
HAYES SMART MODEM 300/1200	212/499
1200B	CALL
ANCHOR SIGNALMAN MARK VII/XII	CALL

SOFTWARE

D-BASE	355	SUPERCALC 3	249
WORDSTAR	CALL	EASYWRITER	CALL
FRIDAY	194	MULTIPLAN	CALL
LOTUS 1-2-3	SAVE	MULTIMATE	CALL
KNOWLEDGEMAN	CALL	10 BASE	CALL

ACCESSORIES

STANDBY POWER SYSTEMS	BEST PRICE
SWITCH BOXES PARALLEL & SERIAL	SAVE
CHIPS 64K	55
MICROFAZER PRINT SPOOLER	FROM 127
COMPUSERVE STARTER KIT	32

DISKETTES

		CASE 100	BOX 10
VERBATIM	SS/DD	180	24
	DS/DD	300	36
MAXELL	SS/DD	220	27
	DS/DD	330	39

AVAILIBLITY AND PRICES SUBJECT TO CHANGE

APPROVED CORPORATE ACCOUNTS WELCOMED

CIRCLE 386 ON READER SERVICE CARD

The PC Peripheral For Only $14.95

That Puts Your Computer's Commands Where They Belong And Your Manuals On The Shelf.

Now, you can command new computer productivity. Discover how much easier your IBM PC or PCjr is to use when the commands are at your fingertips. PC-DocuMate™ keyboard templates can save you time and frustration. You can recall needed commands, options and formats. Quickly.

Professionally designed and comprehensive. Each PC-DocuMate template has been designed by a software expert. Commands are logically and functionally organized so you get the most from your software. And our templates are comprehensive reference aids which use both sides to document a product or a system. Completely.

Durable and guaranteed. PC-DocuMate templates are silk-screened onto durable, non-glare plastic to our exacting specifications. Each template is printed on both sides and color-coordinated to complement your PC. And your satisfaction is guaranteed. Fully. Or your money back.

Save time and enjoy greater productivity. Order your PC-DocuMate without delay.

Lower prices for better design. With PC-DocuMates, you get two-sided templates for less than a single-sided template from other manufacturers. And you get a better designed template. Order direct or ask your local dealer.

PC-DocuMates now available...

IBM PC/XT & COMPAQ — $14.95

DOS/BASIC 2.0 & 2.1 • DOS/BASIC 1.1 • Lotus 1-2-3 • WordStar • dBASE II • MultiMate 3.20 • VisiCalc
Multiplan 1.00 or 1.06 • Volkswriter Deluxe • SuperCalc³ • PeachText 5000 • EasyWriter II • Turbo Pascal • WordPerfect • Do-It-Yourself

IBM PCjr — $12.95

DOS/BASIC 2.1 • MultiMate • dBASE II • Do-It-Yourself

If your favorite software package is not shown here, you can order our "Do-It-Yourself" template (which includes a special pen and eraser) and develop your own custom keyboard template.

Our Guarantee. Use your template for 20 days. If you are not completely satisfied return it to us (undamaged) for a full refund.

HOW TO ORDER: Send personal check, money order or MasterCard/VISA credit card information. Please add $1.50 for shipping and handling per order; foreign orders must add $5.00 per unit (except Canada). US funds only. Sorry, but no COD's. NC residents add 4% sales tax. For more information call 919-787-7703. Corporate quantity discounts available. Dealer inquiries invited. And for faster service on credit card orders...

Call Toll Free

1-800-762-7874

(In North Carolina) 919-787-7703

SMA

SYSTEMS MANAGEMENT ASSOCIATES
3700 Computer Drive, Dept. B-6
Raleigh, North Carolina 27609

The following trademarks are acknowledged: IBM Corp. IBM, IBM PC/XT & PCjr; Ashton-Tate dBASE II; Information Unlimited Software, Inc.; EasyWriter II; Lotus Development Corp.; Lotus 1-2-3; SoftWord Systems, Inc.; MultiMate; Microsoft Corp.; Multiplan; PeachTree Software, Inc.; PeachText 5000; Sorcim Corp.; SuperCalc³; Litetree Software, Inc.; Volkswriter; MicroPro International Corp.; WordStar; VisiCorp; VisiCalc; Borland International Inc.; Turbo Pascal; Satellite Software International, Inc.; WordPerfect.
PC-DocuMate is a trademark of Systems Management Associates. ©SMA 1984

CIRCLE 441 ON READER SERVICE CARD

A Publisher's Circulation File

Small publishers can take advantage of microcomputers and database programs to build circulation management files that are tailored to postal service requirements.

Maintaining subscriber files for a publication's circulation is a prime reason small publishers purchase a microcomputer. But before a publisher can implement an efficient circulation file, he must carefully analyze what information must be included and select a software program appropriate to his needs.

Circulation files contain a wide variety of subscriber-related data, including mailing addresses, payment records, and certain personal facts about the individual subscriber. To capture this information, publishers often try a good mailing list program, but these programs often restrict the choice of fields to simple name and address formats and limit the number of code fields that the list can be sorted by. Database management software is often a better solution for managing a circulation file. It can support hard disk storage, indexing on multiple key fields, and flexible reporting and label printing.

To understand why you need such a powerful system, it is helpful to take a look at the many elements of creating a circulation management program.

File Structure

First you must collect information essential to mailing the publication to the reader, including first name, last name, title, company name, address, city, state, zip, and zone. Publications that mail to consumer audiences will not require fields for title or company name, but if the publication is mailed to many individuals at their business addresses, these fields will be essential. The zone field is used to define which of a possible eight postal zones a reader is in. Its purpose is to create zone reports for the postal service.

Illustration Philip Anderson

Many publications like to gather statistics on their readership both for advertising promotion and to gather a specific profile of the readership to help shape the editorial product. This type of information is usually collected on a subscription or qualification card.

The process of collecting data on occupation, buying habits, size of company, and so forth is best handled by creating one or two character code fields. In searching or counting data, a simple code, such as 01 for Company President, will allow consistent entry and eliminate mismatches from entries such as Co. President and Company Pres.

The number of code fields depends on the amount of data to be collected. For illustration's sake I'll use two code fields: occupation code and industry code. The next group of fields will establish when the subscription begins and ends, and, if it is a paid subscription, the amount paid and the length of term.

The term can be coded according to number of issues or years. The starting and ending dates can be date fields, and the amount collected on the subscription can be designated as a dollar field. The subscription term might include these details: subscription starts, subscription ends, term, amount paid and date paid.

Paid subscribers may wish to be billed at a later date rather than enclosing payment with the card. A simple solution to the "bill me" subscriber is a date paid field. This way the subscriber is sent a bill for the amount of the term, and the date field remains empty until payment is received. You could also use the amount paid field, but for accounting purposes, the date paid will establish which sub-

NEW EXPANDED QUADBOARD BY QUADRAM $265.00
One parallel port, one serial port, clock/calendar, 64K, memory expansion to 384K, game port, I/0 bracket and Quadmaster software.

TANDON TM-100-2 DISK DRIVE $199.00
5 1/4" full height drive, double sided, double density, 320/360K, IBM PC compatible. Specify drive A or B for your PC. Comes with complete step-by-step installation instructions.

OKIDATA ML92/P PRINTER WITH PLUG AND PLAY INSTALLED $429.00
160 cps, 80 columns, all points addressable graphics, correspondence quality printing capability. Full IBM-PC compatibility.

AMDEK COLOR II MONITOR $399.00
AMDEK 300G MONITOR $129.00
US ROBOTICS PASSWORD MODEM $339.00

DATASHIELD SURGE PROTECTOR MODEL 85
Filters out voltage jumps, electromagnetic interference and radio frequency interference. Features six outlets, on/off power switch and reset button.
. . . . . $59.00

DATASHIELD UPS MODEL PC200
Backup power source, provides up to 30 minutes of continuous 120 VAC, 60 Hz power (load dependent). Also eliminates voltage surges and noise.
. . . . . $339.00

TG JOYSTICK $39.00
LOTUS 1-2-3 . . . . . $319.00
COMPUSERVE $32.00

CALL 1-203-888-1867
MON.–FRI. 9–5

GEM

GEM ELECTRONICS, INC.
24 Carriage Drive
Oxford, CT 06483

Prices reflect 3% cash discount. Add 3% ($4.00 minimum) for shipping. Call for shipping charges for monitors, printers, and PC 200. Prices and availability subject to change without notice. Products shipped in factory cartons with manufacturer's warranty. Connecticut residents add 7.5% sales tax.

CIRCLE 255 ON READER SERVICE CARD

scribers are to be appropriated into the accounting cycle.

Key Fields

Circulation files are usually large, and although the number of fields should be kept to a minimum, many fields are needed for sorting purposes.

In the circulation field I've described here, you would need to count, search or sort by the last name, zip code, zone code, occupation code, industry code, subscription starts, subscription ends, term, amount paid, and date paid fields. Since many database programs have a limit on how many key fields may be active at one time, you should choose one that allows as many key fields as possible to be active.

Certain programs allow for multiple key fields but also allow these fields to be activated or deactivated at any time. This feature is useful for creating seldom-used counts or reports. For example, zip code and last-name fields may be used constantly for subscriber lookup, while occupation codes may be used only for special reports. By activating the key field only when needed, a program will be able to index records faster.

Once you've established the basic fields for the circulation file, mailing labels, reports and counts, and invoices for "bill me" and renewal subscribers can be printed. But before you can begin, there are a few other factors that will affect how you set up your circulation file.

To obtain the lowest postal rates for a publication, you must conform to strict requirements established for publications seeking to mail at second- or third-class postal rates. Doing so will save you a substantial amount in postage. For example, postage for a 6-ounce publication mailing at first-class rates would cost $1.05. At second-class rates, postage for the same magazine might be as low as 13¢. To qualify for these rates, the publisher must structure circulation files to conform to the postal service's rules.

For instance, most newsletters are mailed at first-class rates; a publisher can save money by presorting first class mail, which requires that the circulation file be sorted by zip code, and that the mail be bundled by zip code series, city, or state.

Mailing Rates

Many magazines mail at low, third-class (bulk) rates. The same zip code sort and bundling procedures apply here too, even though these publications will take much longer to reach their destinations.

The most demanding postal requirements, however, are for magazines mailing at second-class rates. This rate, commonly referred to as "controlled circulation," offers the publisher rates slightly lower than third-class, but with expeditious handling. This means the magazines mail at the lowest rates possible but take a week or two to reach the subscriber.

The most demanding postal requirements are for magazines mailing at second-class rates.

To qualify for controlled circulation rates, the publisher must prove to the postal service that at least 50 percent of those receiving the publication have requested it by a paid subscription or written request within the last 3 years. Once established, the publication's contents are divided into editorial advertising content, and you'll pay a premium rate for the mailing weight of the advertising and a minimal rate for the weight of the editorial.

To provide the postal service with this information, the circulation file must indicate which readers have requested the publication and when they did so. In addition to computer records, publishers must keep the actual written requests or subscription cards since the postal service may actually audit the circulation file. *(continued)*

NOW AVAILABLE—
THE MASTER DIRECTORY OF PRODUCTS FOR YOUR IBM PC

Nearly 400 pages of the most current listings and information for IBM PC, PC XT, PCjr and compatible hardware, software, accessories and services—from the publishers of PC.

YOUR PRIMARY REFERENCE...

orgonizing over 4,000 products and 1,500 vendors, services, ond support systems in one comprehensive, eosy-to-use guide. PC: THE BUYERS GUIDE is the quickest and mast relioble woy to locote exoctly whot you need to expond the usefulness of your personol computer.

Becouse it's published quorterly in Moy, August, November ond Februory, PC: THE BUYERS GUIDE is the most up-to-dote guide of its kind, occurotely describing each product ond its function ond cost. Find out whot level of skill is required to get the most from the product ond *everything* is *logicolly* categorized ond indexed with cross-references so you won't miss one *listing!*

GET MORE FROM YOUR PC

The documentation you received from IBM is only the beginning. Finding the *right* hardwore ond softwore is whot really mokes the difference in how effectively your IBM or compotible PC performs—thot's why you need PC: THE BUYERS GUIDE! You'll also find detailed listings for the following importont services ond occessories:

- Consultonts
- On-line Bulletin Boord
- Dotoboses
- Furniture
- Retoil ond Moil Order Outlets
- Literoture
- User Groups
- Insuronce Services
- Professionol Societies
- Retoil Clubs
- Computer Groups
- Mointenonce services

AND MUCH MORE!

Be sure to order your copy of PC: THE BUYERS GUIDE todoy—fill out the coupon ond moil it now!

PHONE TOLL FREE 9 am-5 pm EST:
1-800-526-0790
(In New Jersey 201-540-0445)

ALSO AVAILABLE AT YOUR LOCAL NEWSSTAND AND COMPUTER STORE

PC THE BUYERS GUIDE

CN1914, Morristown, NJ 07960

Please send me PC: THE BUYERS GUIDE. Enclosed is $9.50 ($7.95* per copy, plus $1.55 each for postage and handling.) ($11.00 outside USA, send US funds only). *Residents of CA, CO, CT, DC, FL, IL, MA, MI, MO, NJ and NY State add applicable sales tax.

Charge My:
☐ American Express ☐ Visa ☐ MasterCard

CARD NO. _____ EXP DATE

MR./MRS./MS. _____ print full name

ADDRESS _____

CITY/STATE/ZIP _____ NX4F

CompuCable provides: "Tomorrow's Connections... TODAY!"

CompuCable Corporation is a pioneer in the manufacture of innovative interface cable assemblies. We begin with the finest materials available and assemble them to please the most discriminating customer. Our cable assemblies feature:

- EMI/RFI fully shielded interlocking hoods
- gold at point of contact
- heat shrink tubing at points of connection and exit
- stranded copper inner conductors with PVC jackets
- tough PVC outer cable jacket
- over 800 cable configurations are currently available and ready for shipment, and
- we manufacture custom configurations.

We are also your single source connection for microcomputer products and accessories like:

- IBM* PC visual enhancement screens for color and monochrome monitors
- IBM PC disk drive and keyboard dust cover sets
- interface and memory boards for most popular computers
- and data transfer switches.

Contact the CompuCable sales and warehousing office nearest you to get the whole story.

We're committed to being your single source connection for microcomputer product and accessories today...and tomorrow!

COMPUCABLE CORPORATION

Tomorrow's connections...today!

*IBM IS A TRADEMARK OF INTERNATIONAL BUSINESS MACHINES
© 1984, COMPUCABLE CORPORATION

CIRCLE 172 ON READER SERVICE CARD

In addition to complying with postal requirements, a publisher should keep records of when subscriptions begin and end, how much money was collected, and the term of the subscription. This information establishes the number of issues that the subscriber will receive and tells the publication when to initiate a renewal effort.

For more complex operations, the payment information may also be used for accounting purposes. Unlike most products that are simply bought and sold at one point in time, a subscription to a magazine is sold in increments.

To understand this concept, which is called "earned income," let's look at a 1-year, 12-issue subscription costing $12. When the subscription is paid for by the reader, the publisher receives $12. However, nothing has been delivered to the subscriber at this point. If the reader canceled the subscription, the publisher would have to refund this amount.

Therefore, you can't spend the $12 before you actually "earned" it. To accommodate this situation you need to establish an "earned income" system where each time a magazine is mailed to a reader, the publisher earns an incremental amount, in this case $1.

To avoid an accounting problem, the publisher must keep track of how many issues are sent out each month and how much money has been earned. This information can then be generated from the circulation file.

The most important element of a successful circulation file is a database program's ability to count selected fields without creating a report.

A publisher must prepare various reports for the postal service, but it is also essential to be able to count records without running through the time-consuming report process. The publisher needs a program that is sophisticated enough to accommodate a complex circulation file, but at the same time will allow a simple query to produce a simple numeric answer. ■

IBM PC & XT

IBM PC & XT Computers Call

SOFTWARE FOR IBM PC

dBASE II $350
Lotus 1-2-3 $CALL
Home Accountant Plus $99
Peach Pak Series 4 IA/R, A/P, G/L/I $235
Peach Text 5000 $237
PFS: File $99
PFS: Report $79
PFS: Graph $99
PFS: Write $89
SuperCalc II $145
SuperCalc III $259
TKI Solver $219
Versaform $299
Wordstar Professional $349
Word with Mouse $299
Microsoft Word with Mouse $288
Hayes Smartcom II $79
Multiplan $155

COMPAQ

Compaq 128K, 1 drive $CALL
Compaq 256K, 2 drives $CALL
CompaqPlus, 128K, 1 drive 10MB hard disk $CALL
CompaqPlus, 256K, 1 drive 10 MB hard disk $CALL

COLUMBIA COMPUTERS

Model 1600-1, Two drive system Call
Model 1600-4, One drive & one 12MB hard disk system Call
Model 1600-VP Portable unit with two drives 9" monitor Call

SANYO

DESK TOP BUSINESS COMPUTERS

MBC 880, 128K, 1 drive .CALL
MBC 555, 128K, 2 drives CALL
Sanyo green monitor $179

KAYPRO

CALL FOR PRICE!

MONITOR SALE

FREE interface cable (value $15)!!

★★★★ RGB COLOR ★★★★

Princeton HX-12, 12" RGB Color, high resolution 690 dot, 16 colors, similar to cabinet as IBM monitor $466

Amdek RGB Color II Plus, 640-dot h resolution, 16 colors $459

★★★ GREEN SCREEN ★★★

ELKA [illegible], 12", 640x350 high resolution, 20 MHz $115

Dynax GM 12G, 12" green high resolution 800-dot, 20 MHz $129

Roland DG MB 122G, 12" green, 18 MHz hi-resolution 720x350 dots, fully compatible with IBM monochrome display card $Call

USI PI-2, 12" green, 1000-dot high resolution, 30 MHz $129

Taxan KG-12N, 12" green, 800-dot h $148

★★★ AMBER SCREEN ★★★

Dynax AM-12L, 12" amber, 640-dot hi resolution, 20MHz $135

Taxan KA12N, 12" amber, 800-dot h resolution $129

USI PI-3, 12" amber, 1000-dot hi-resolution, 20MHz $195

Amdek 310A, 12" amber, 800-dot h resolution, designed to run on IBM [illegible] card $135

Princeton MAX-12, 12" amber, 720 x 350 dot, runs off IBM monochrome display adapter $199

AST

Multi-Function Cards for IBM PC and XT

(Each card now comes w/ SuperDrive & SuperSpool)

SixPakPlus Cards

Memory installed on card	none	64K	128K	192K	256K	320K	384K
with parallel, serial ports & clock	$227	$267	$317	$367	$417	$467	$517
above plus game port	$262	$302	$352	$402	$452	$502	$553

MegaPlus II Cards

Amount of memory installed on board	None	64K	128K	192K	256K
w/serial port No. 1 & clock	$226	$266	$316	$366	$416
w/either parallel or serial port No. 2	$274	$314	$364	$414	$464
w/both parallel & serial port No. 2	$308	$348	$398	$448	$498

MegaPak – expands a fully populated MegaPlus card (256K) to 512K $299
Optional Game Port add $50

I/O Plus II Cards

Standard card w/one serial port (SP) and clock/calendar $129
Additional Parallel (P), Game (G), or Serial 2 (S2) port add $36 ea.

QUADRAM

QUADMASTER II – 9 Function memory expansion card for IBM PC

- Up to 384K
- Game port
- Chronograph
- Parallel port
- Serial port
- Qwerp 6 inserts out put to LPT 1, 2 or 3
- QuadRAM drive
- Memer speed
- I/O bracket

Amount of memory installed	0K	64K	128K	192K	256K	320K	384K
w/parallel, serial, game ports, clock	$235	$275	$325	$375	$425	$475	$535

Add Multi-Tasking to your IBM-PC and XT now!

TASC MASTER software with AddRam Elite or AddRam Plus Ultimate Multi-Function Boards

AddRam Elite (parallel & serial ports) AddRam Plus (Two serial ports)

Memory installed	64K	128K	192K	256K	320K	384K	448K	512K
	$399	$459	$515	$575	$639	$699	$759	$819

STB

RIO PLUS Multi-function memory expansion card for IBM-PC/XT 64K-384K parity checked memory. Complete with parallel port, RS-232C serial port, game port, clock/calendar, print buffer/disk emulator software

memory installed	64K	128K	192K	256K	320K	384K
	$289	$339	$389	$439	$489	$539

Special Purpose Cards

HERCULES GRAPHICS CARDS – Creates resolution graphics on the IBM monochrome $349
Amdek MAI Board – for both monochrome & color monitor plus 96K user memory expansion $459
Paradise Multi-Function Card – for both color and monochrome displays, w/ parallel port $399
Vista Disk Master – Disk controller card for both 5¼" & 8" drives, IBM-PC/XT compatible $169
PLANTRONIC ColorPlus Offers more colors in hi resolution plus parallel port $379
TECMAR GRAPHIC MASTER – Multi-function graphics board for both RGB color or monochrome displays and can do graphics on both $499
STB Color Graphics Board – The newest entry from STB. Operates RGB color or monochrome monitor. It can also do graphics on the monochrome display $389
QUADLINK – An Apple emulator card enables the IBM PC to run Apple II software No 8 starts reformatting necessary $479
MULTIGRAPH Monochrome & Color Display Adapter – 720x380 line monochrome graphics. Lotus 1-2-3 compatible. Capable of running software designed for color graphics on monochrome display. 32-bit internal architecture, 32K on board memory $495 Parallel Port option $75

Hayes Smart Modems

300 — $165
1200 — $489
1200B $439
Smartcom II software $79

DYNAMIC RAM CHIPS

4118 (16K) 200 ns $1.50 ea. 9/$12
4164 (64K) 200 ns $5.00 ea. 6/$50
4164 (64K) 150 ns $8.95 ea. 6/$90

DAVONG HARD DISKS

SIZE	INTERNAL with controller	EXTERNAL without controller	EXTERNAL with controller
10MB	$1,979	$1,795	$1,895
15MB	$2,169	$2,135	$2,235
21MB	$2,479	$2,535	$2,635
32MB	$2,965	$2,085	$3,185

18MB Tape Backup for DaVong hard disk (w/o hard controller) $1,435
18MB Tape Backup w/controller $1,595
Networking Kit to hook up a total of IBM PC's. Comes w/software $1,899

Sysgen TAPE BACKUP

An economical way to back up 10MB in 4 minutes on a single cassette $CALL

IBM [illegible]

5¼ DISK DRIVES

Tandon TM-100-1, full ht, DSDD $159
Tandon TM 100-2, full ht, DSDD $199
Tandon TM 100-4, full ht, DSDD, $235
Control Data 9409, full ht, DSDD $225
[illegible] $185
Teac 55B, half ht, DSDD Sale! $189
National, half ht, DSDD Sale! $105
Qume 142, half ht., DSDD $239

NEC SPINWRITER

3550 – 33 CPS, 203 col., proportional space, bi-directional parallel $1,575
2050 – Similar to 3550 but 18 cps $939
7730 – 55 CPS, 203 col. parallel $1,795
Above prices include tractor feed & ribbon

C ITOH F-10

40 CPS daisywheel (parallel) $995
55 CPS daisywheel (parallel) $1,345
Tractor for F-10 $225

ABATI LQ 20

18cps Daisywheel printer. Qume compatible, 10, 12, 18-pitch, proportional spacing, uni-directional incremental/bi-directional logic seeking by software, 13" paper width parallel $435
Optional Tractor $90

ROLAND DXY 800 Plotter

Now includes free [illegible]

8-pen intelligent X-Y Plotter. Hi-speed 180mm/sec. IBM-PC compatible. 11" x 17" paper size. Horizontal or vertical operation. Dual speed switch. Parallel and serial interfaces $595

The POWER DIRECTORS

P2 – A unique control center and surge protector w/8 lighted and a master rocker switches for your computer & accessories. It also filters out EMI & RFI interferences $99
P12 – Similar to P2 but w/8 switches & a master switch & digital clock $129

EPSON

FX-80, 160 CPS, 80 Col., friction & tractor feed, parallel Call
FX-100, 160 CPS, 132 Col., friction & tractor feed, parallel Call
MX-80F/T, 80 cps, 80 col., tractor and friction feed, parallel CALL
MX-100F/T, 100 cps, 136 col., tractor, friction feed, parallel CALL
RX-80, 120 cps, 80 col., tractor feed only, parallel CALL
RX-80F/T, same as RX-80 but includes friction feed CALL

STAR GEMINI

Gemini 10X, 120 CPS, 80 Col., friction & tractor feed, (parallel) $Call
Gemini 15X above w/15" platen Call
Delta 10, 160 cps, 80 col., parallel Call
Delta 15, above but 15" carriage Call
PowerType, 18 cps daisywheel CALL
Radix 10, 200 cps, 80 col., parallel CALL
Radix 15, 200 cps, 132 col., parallel Call

C ITOH

8510AP Prowriter, 120 cps, 96 col., graphics, parallel $335
8510-SP, above but 180 cps $CALL
8510-SCP, above but w/3 color ribbon (red, yellow, blue) also capable of doing orange, green, purple, brown, black Call
1550 Prowriter II, 120 cps, 136 col., 2K buffer, graphics, parallel $525
1550-SP, above but 180 cps $CALL
1550-SCP, similar to 8510-SCP but w/15" carriage $CALL

IDS PRISM

IDS Prism 80, 200 cps, 80 col., graphic, tractor/friction feed, parallel $1,199
IDS Prism 80C above + 4 color $1,299
IDS Prism 132, similar to Prism 80 but 132 columns, parallel $1,395
IDS Prism 132C, above + 4 color $1,495

TOSHIBA

Super dot-matrix printer w/24-pin hi-resolution head. 192 CPS draft, 100 CPS letter-quality
P1351 – 132 column (parallel) $1,499
P1340 – Similar to 1351 but smaller Call

MANNESMAN TALLY

160L – 160 CPS, 80 column, 6 fonts, friction & tractor feed, parallel and serial interface $586
180L – Like 160L but 136 col. $799

OKIDATA

ML-82A, 120 CPS, 80 col., pin & friction feed, serial & parallel $316
ML-83A, 120 CPS, 136 col., tractor & friction feed, parallel/serial $595
ML-84P, 200 CPS, 136 col., friction & tractor feed (parallel) $895
ML-84S, above but serial $1,059
ML-92P, 160 CPS, 80 col., friction & tractor feed, (parallel) $CALL
ML-92S, above but serial $595
ML-93P, 160 CPS, 136 col., tractor & friction feed, (parallel) $739
ML-93S, above but serial $799
2410P, 350 CPS, 136 col., friction & tractor, 2-color (parallel) $2,295

BROTHER HR-25

Newly 23 CPS daisywheel printer w/2 color printing, 3K buffer, proportional spacing, etc. Parallel CALL
Tractor for HR-25 $119
Cut Sheet Feeder for HR-25 $195

BROTHER HR-35

Newly 35 CPS daisywheel printer CALL

DYNAX DX-15

Letter quality daisywheel printer with 2-color printing, bi-directional proportional spacing & bold printing, super/sub script, 43 CPS, 3K buffer, Parallel interface $CALL
Cut sheet feeder $199
Tractor $119
Keyboard $179

JUKI 6100

[illegible] CPS, [illegible] col., 2K buffer, 3-pitch, (parallel) $435
Tractor for 6100 $120

All merchandise is brand new & fully guaranteed. All prices reflect 3% cash discount for full payment by cash, cashier's check or money order. Personal or company check requires 2–3 weeks to clear. Visa, Master, American Express cards & PO's accepted from qualified customers. COD's accepted with 20% paid deposit plus $3 COD fee (by UPS only). No COD's to Canada or FPO/APO. Shipping/insurance/handling charges: 3% of total order value by UPS Surface, 6% by UPS Air & Parcel Post (Min. $3). Calif. residents add sales tax. No sales tax on out-of-state orders. Prices & availability subject to change without notice.

EASTERN ENTERPRISES, INC.

Mail Merchandising Since 1969

2937 S. VAIL AVE., LOS ANGELES, CALIF. 90040

(Hours: Monday-Friday 8:30am-4:30pm Pacific Time)

TOLL-FREE (ORDERS ONLY) (800)392-7081

Calif., Alaska, Hawaii & all info Call (213)725-3080

CIRCLE 235 ON READER SERVICE CARD

"More Computer for Your Calculating Dollar"

Try the New

XPC-XT by XOR

Introductory Offer

$1995.00

SYS-8100-00

"Need a 16-bit IBM-PC™ to process your data?"

The first IBM™ compatible that IS compatible! A complete system including the PC-DOS™ operating system from IBM™. Two thinline double-sided 5¼" Disk Drives hold 360K of formatted storage each, the other drive opening is fitted with a close-out plate. Removal of the plate will allow room for a Winchester Hard Disk. The Power Supply is like that of an IBM-PC XT™..Hard Disk ready! How compatible is the XPC-XT? It will run 1-2-3™, Flight Simulator™, dBASE II™, WordStar™, SuperCalc™, VisiCalc® and hundreds of others, The system will also support MS-DOS™ 1.1 and 2.1, PC-DOS™ 2.2, CP/M-86™ and Unix Operating Systems. Add-on an additional 192K of RAM for a full 256K of on-board Memory for only $195.00. This computer comes standard with 2 Serial and 1 parallel ports (IBM™ COM1 and COM2). No need to purchase Add-On cards.

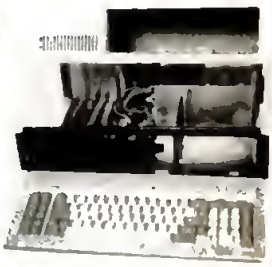
Standard Features:

- PC-DOS™ Operating System Vers. 2.1
- 64K of parity checked RAM, expandable on-board to 256K
- 8088 16-bit CPU
- 5 IBM compatible expansion slots
- 4 DMA and 3 Timer channels
- Up to 32K of EPROM (supplied with full 8K)
- DOS BIOS on EPROM
- Full size capacitance touch keyboard with 10 function keys and calculator type numeric keypad
- 8087 Math Co-Processor ready
- 110-220 VAC, 50-60 Hz
- High resolution, 12" Monitor with Green Screen and 18MHz bandwidth.
- Two Slimline 5¼" DS/DD 48 TPI Floppys @ 360K storage each.
- Floppy Disk Controller expansion card, runs up to four SS or DD Floppys
- *ALSO* supports MS-DOS™ and CP/M-86® Operating Systems
- Power Supply is Hard Disk ready, no need to add-on additional power
- Full One Year Parts and Labor Warranty on all **XDS Manufacturing** products!

BASIC XPC SYSTEM

If that incredibly *LOW* Total System price doesn't suit you, try this ***"Do It Yourself System"*** and take your pick of the wide range of options listed below.

The Features: •64K RAM •Expandable to 256K •4 DMA channels •5 Expansion Slots •Runs MS/DOS™ and CP/M-86™ (not included) •Multi-function Keyboard and Cable •Hard Disk Ready Power Supply •2 Serial and ons Parallel Port •and MORE! •SYS-8000-00



Only **$895**

The following are registered Trademarks and their Companys: 1-2-3-Lotus Development Company, MS-DOS, PC-DOS, Flight Simulator-MicroSoft; dBase II-Ashton-Tate, WordStar-MicroPro International Corp.; SuperCalc-Sorcim, Inc.; VisiCalc-VisiCorp, Inc.; CP/M-86-Digital Research Inc.; IBM, IBM-PC, IBM-PC XT-International Business Machines.

Call or Write for Nearest Dealer and Full Catalog

IBM-TYPE KEYBOARD

IBM-type keyboard. Super touch! (Even nicer than IBM!) L.E.D. indicator for CAPS and NUM LOCK. Also different layout available to conform with Selectric.

KEY-1000-00 ..... $139.00
KEY-1024-00 (SEL) $195.00

POWER SUPPLY

Linear power supply with fan and power filter. Fits in case above. Uses 140 watts and runs hard disk. Mounting hardward and power cord included.

POW-1030-00 ..... $175.00

MOTHERBOARD

Two IBM-style mother boards, 8-slot and 8-slot. Five-slot has two serial slots and one parallel. Both 256K expandable.

BOA-8000-00 ..... $450.00
BOA-8050-00 (8 SLOT) $485.00

FLOPPY DRIVES

Your choice: Panasonic or Hitachi 48-TPI double-sided. Perfect for your IBM-type systems. 90 day warrantee! Shipped same day as ordered! Cables too!

(PAN) DRI-6600-00 ..... $175.00
(HIT) DRI-6650-00 ..... $170.00

XDS MANUFACTURING

HARD DISK ADD-ON

Complete Packages

Includes BIOS Software, 5¼" Winchester Hard Disk, mounting hardware, Interface P.C.B. for expansion slot, and all the necessary power and data cables (the Power Supply in the **XPC-XT** is Hard Disk ready).

10 Megabyte $995	65 Megabyte $2495
20 Megabyte $1295	105 Megabyte $3295
40 Megabyte $1795	140 Megabyte $4195

10-MEG TAPE BACKUP

★★★$395.00★★★

½" high cassette type tape backup can be added to any HD system by removing one floppy. File managed software included!

IBM-TYPE CASE

Two styles to choose from, 5-slot and 8-slot. Includes hardware to mount drives and IBM-type circuit board, but no power supply. CAB-3050-00 ..... $149.00
CAB-3060-00 (8 SLOT) $149.00

COLOR

MON-1500-00 $345.00

MONOCHROME

MON-1000-00 $125.00

Three models of Color to choose from, each with higher and higher resolution. Price from $345.00 to $780.00. Monochrome Unit is outstandingly clear and easy on the eyes. In Green or Amber screens.

BOARDS

FLOP/SCSI/RTC

80A-8648-00 ..... $149

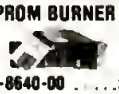
COLOR/MONO

80A-8410-00 ..... $299

MODEM

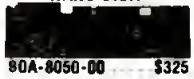
80A-8725-00 ..... $295

PROM BURNER



80A-8640-00 ..... $129

HARD DISK



80A-8050-00 ..... $325

MULTIFUNCTION

80A-8660-00 ..... $225

MEMORY 512KW/64K

80A-8650-00 ..... $195

CALENDAR CLOCK

80A-8700-00 ..... $ 99

XDS Manufacturing ■ 5791 Machine Drive ■ Huntington Beach, CA 92649 ■ 714/898-0336

CIRCLE 211 ON READER SERVICE CARD

COMING UP

PCjr.

A Member of the Ziff-Davis Family of IBM PC Magazines

Flight Simulator
America's number one game now comes in a Junior version. *PCjr.* lets it fly and takes a look at two more simulation games along the way.

Junior at Work
IBM's Cluster Program allows the interconnection of up to 64 computers for business use. Learn how Junior fits in.

New Disk Drives
A second disk drive for your PC*jr* will prove to you that two heads are better than one.

Word Play
Learn about the text according to *NewWord*. It might shake your faith in other word processing programs.

Sound Advice
An excerpt from Peter Norton's latest computer book explores the magic and mystery of Junior's three-tone sound capabilities.

Comp-U-Store
An on-line shopping mall for those who'd rather let their fingers do the walking. Plus a visit to the comp-u-storeroom.

Columns
Editor's Wire by Corey Sandler; Junior Explorer by Peter Norton; Screen Play by Don Kennedy; Opinion by Lindsy Van Gelder and Stephen Manes; Education by Martin Porter; Logo by Winn Rosch; BASIC by John Woram; Communications Networks by Eric Freedman; Reader to Reader by Paul Somerson.

HARD DISK SUBSYSTEM
- 10 OR 20 MEGABYTE CAPACITY
- DOS 2.0 COMPATIBLE
- SYSTEM INCLUDES DRIVE INSTALLED IN CABINET WITH POWER SUPPLY, INTERFACE CARD FOR INSTALLATION IN PC AND CONNECTING CABLES

10 MB - $1995 20 MB - $2295

BUS EXPANSION MODULE
- DOUBLES THE EXPANSION BOARD CAPACITY OF THE PC
- INTERFACES TO PC THRU SIGNAL CONDITIONED CABLE ASSEMBLY WHICH OCCUPIES A SINGLE SLOT IN PC
- SYSTEM INCLUDES CABINET WITH 6 SLOT BACK PLANE AND 4 OUTPUT POWER SUPPLY, INTERFACE CARD AND CONNECTING CABLE - $645

DESERT TECHNOLOGIES
P.O. BOX 41628
TUCSON, AZ 85717 (602) 882-1741

CIRCLE 186 ON READER SERVICE CARD

FREE CATALOG!

SAVE MONEY on Computer Supplies from NEBS.

NEBS is a leader in providing small businesses with hundreds of low-priced, top quality computer products:

- Continuous Checks, Statements Invoices and Letterheads
- Diskettes
- Ribbons
- Furniture
- Accessories

Keep your computer running smoothly and profitably.

Call Toll Free 1-800-325-1117 for your FREE NEBS Computer Forms Catalog or complete and return the coupon below.

NEBS

NEBS Computer Forms
12 South Street
Townsend, MA 01469
Attn: Customer Service

Name
Title
Company Name
Street Address
City, State Zip
CODE 41810

SAVE MORE THAN EVER ON...
3M Scotch® DISKETTES
AND OTHER COMPUTER NEEDS!

NEW! Lower Prices

LIFETIME WARRANTY!

3M BULK DISKETTES AT TREMENDOUS SAVINGS!

These are *genuine* 3M diskettes with a lifetime warranty. But they are bulk packed in cartons of 50 with separate white Tyvec envelopes. **No identification labels, write protect tabs or cartons are provided!** A great buy for volume users.

$160 ea. Qty. 50 ← 5¼" SSDD

5¼" DSDD → **$202** ea. Qty. 50

5¼" SSDD-96TPI	$2.20	5¼" DSDD-96TPI	$2.75

All have reinforced hub.
SOFT SECTOR ONLY!
(for IBM, APPLE, KAYPRO, DEC and about 99% of all computers.)
Must be ordered in multiples of 50!

BOXED 3M DISKETTES WITH ALL THE TRIMMINGS!

Factory-fresh 3M packaging with envelopes, 3M logo labels, ID labels and write-protect tabs.

$185 ea. Qty. 20 ← 5¼" SSDD

5¼" DSDD → **$235** ea. Qty. 20

5¼" SSDD-96TPI	$2.60	8" SSSD	$2.05
5¼" DSDD-96TPI	$3.25	8" SSDD	$2.50
		8" DSDD	$3.10

Minimum order of 20 diskettes. Additional diskettes in multiples of 10.

3M HEADCLEANING KITS
Stop swearing and start cleaning. This non-abrasive cleaning kit has everything you need for thirty applications.
$23.00 + $1.50 Shpng

SAVE MONEY WITH A CLEAN COMPUTER!
INTRODUCING MINI-VAC

Most computer malfunctions are caused by dust. MINI-VAC is ideal for cleaning keyboards, screens, drives and printers. (Great for photo equipment, too!) Equipped with an easy-empty bag, two directional wands and two fine-brush nozzles. Don't compute without it. (Requires 9-volt battery which is **not** included.)
$21.95 + $3.00 Shpng

AT LAST: A DISK DRIVE DIAGNOSTICS SYSTEM THAT WORKS!
The Dymek Recording Interchange Diagnostic (RIO) is a **professional**, but easy to use, drive diagnostic disk. It tests drive speed, radial position, hysteresis, write function, erase crosstalk, signal-to-noise and clamping. In short, it is a professional's system that will help you keep your machine in prime condition... and avoid the evils of data loss.
$29.95 + $1.50 Shpng

MEDIA-MATE 50: A REVOLUTION IN DISKETTE STORAGE
Every once in a while, someone takes the simple... and makes it elegant. This unit holds 50 5¼" diskettes, has grooves for easy stacking, nipples to keep diskettes from slipping in the case and several other features. We like it.
$10.95 + $2.00 Shpng

DISKETTE 70 STORAGE: STILL A GREAT BUY
Dust-free storage for 70 5¼" diskettes. Six dividers included. An excellent value.
$14.95 + $3.00 Shpng

PRINTER RIBBONS AT BARGAIN PRICES.

EPSON MX-70/80	$3.56 + 25 Shpng
EPSON MX-100	$6.99 + 25 Shpng
Okidata Micro 84	$3.56 + 25 Shpng
Diablo 630 Mylar	$2.80 + 25 Shpng
Diablo 630 Nylon	$2.93 + 25 Shpng

THE END TO RS-232 CABLE PROBLEMS: SMARTCABLE
Now interfacing almost any two RS-232 devices is simple and quick. Just plug in SMARTCABLE and flip two switches. The logic of both devices is figured out immediately and you can get to work.
$79.95 + $1.50 Shpng

Shipping: 5¼" DISKETTES—Add $3.00 per 100 or fewer diskettes. 8" DISKETTES—Add $4.00 per 100 or fewer diskettes. OTHER ITEMS: Add shipping charges as shown in addition to diskette shipping charges. **Payment:** VISA and Mastercard accepted. COD orders only, add $3.00 handling charges. **Taxes:** Illinois residents please add 8% sales tax.

WE WILL BEAT ANY NATIONALLY ADVERTISED PRICE ON THE SAME PRODUCTS AND QUANTITIES!
Nationwide: 1-800-821-6627
Illinois: 1-312-944-2788
Hours: 8AM - 5PM Central Time
Minimum Order: $35.00

DISK WORLD!, Inc.
SUITE 4806
30 EAST HURON STREET
CHICAGO, ILLINOIS 60611

Authorized Distributor
Information Processing Products

3M

COMING UP

FOR IBM PERSONAL COMPUTER USERS
PC TECH JOURNAL

A Member of the Ziff-Davis Family of IBM PC Magazines

Mouse Pop-up Menu Software

Learn how to create customized pop-up menus with Trillian's *VisuALL*, Mouse Systems' *Designer Pop-Up Menus*, or Microsoft's *Mouse Menus*.

IBM Cluster

PC Tech Journal's coverage of linking PCs together continues with a technical review of the Cluster Program, IBM's first offering in the PC-interconnection sweepstakes.

Communications Products from IBM

Two technical reviews will examine version 2.0 of the *Asynchronous Communications Support* and the electronic mail package for the PC, the *Personal Communications Manager*.

Assemblers

Advanced macro techniques using ASM-86, plus macros that allow access to the power of assembly language and the convenience of structured programming, will be explored. Also, a look at Digital Research's PC:DOS assembler, RASM-86.

Memory Management

Acquire a better understanding of one of the most important features of any operating system through this look at how DOS handles memory management.

CHARGE ORDERS—for your convenience,
PHONE TOLL FREE 800-526-0790. In New Jersey only 201-540-0445.

PC Poster Offer, CN 1914, Morristown, NJ 07960

Please send _____ prints of Mark McCandlish's "Inside the IBM Personal Computer" @ $10.00* each plus $2.50 postage & handling. Outside USA add $5.00 postage & handling.

☐ PAYMENT ENCLOSED $_____

☐ CHARGE: ☐ Visa ☐ MasterCard ☐ American Express

Card No._____ Exp. Date_____

Signature_____

Print Name_____

Address_____

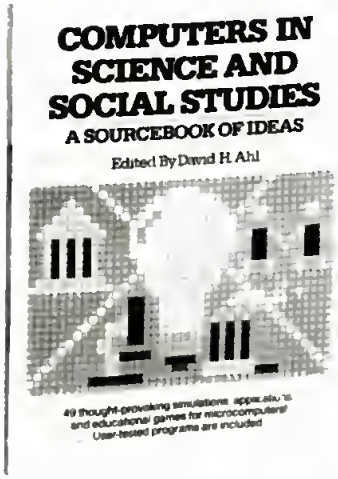
City/State/Zip_____

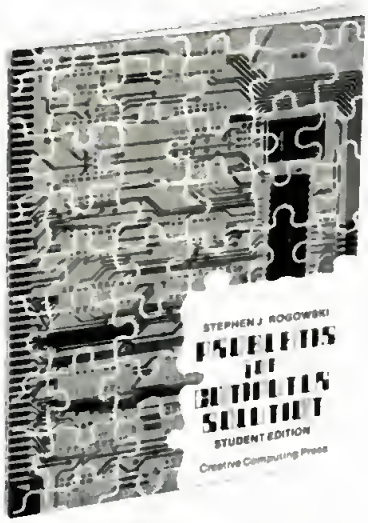
*Residents of CA, CO, CT, DC, FL, IL, MA, MI, MO, NJ, and NY State, add applicable sales tax.

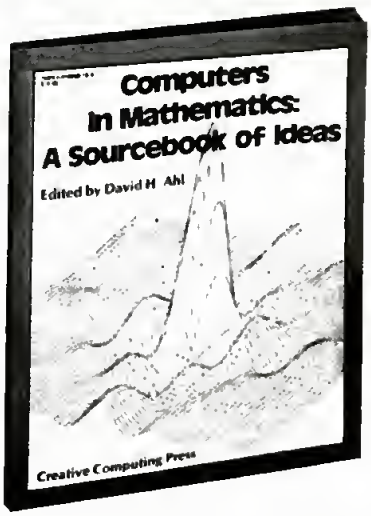
Unique Art Poster Offer—A Cutaway View of the IBM Personal Computer!

24" x 32" poster, "Inside the IBM Personal Computer" by Mark McCandlish. Printed on quality heavyweight poster stock. Only $10 plus $2.50 for postage and handling.

For home or classroom







Use these three books for state-of-the-art learning material!

COMPUTERS IN SCIENCE AND SOCIAL STUDIES

Edited by David H. Ahl

Are you involved with one of the physical or social sciences? This new book brings together 40 science-oriented computer articles from the pages of *Creative Computing*.

Fields covered include Social Studies, Psychology, Chemistry, Biology, Physics, Health, Ecology, Astronomy, History, Economics, Geography, Medicine—even Interstellar Trade! You'll find games, brief tutorials and programs that bring together the many exciting uses of the computer in social studies and science!

8½" x 11", softcover.
$14.95 ($2.00) #9X

PROBLEMS FOR COMPUTER SOLUTION

By Stephen Rogowski

Here are 90 intriguing math and science problems—most consisting of several parts—that will provide hours of fascination and challenge. Each problem is clearly presented and thoroughly discussed, with references made to standard math texts. Problems cover eight areas: arithmetic...geometry...trigonometry...number theory...probability...statistics...calculus...science.

The Student Edition includes only the problems, while the Teacher's Edition contains problems, solutions, a complete listing and run in BASIC for each, and in-depth analyses explaining the algorithms and theory for each problem.

8½" x 11", softcover.
Student Edition $4.95 ($1.00) #9Z;
Teacher Edition $9.95 ($2.00) #9Y

COMPUTERS IN MATHEMATICS: A SOURCEBOOK OF IDEAS

Edited by David H. Ahl

Scores of ready-to-use, classroom-tested ideas in dozens of areas such as solving differential equations...trigonometric functions and Tchebychev approximations...computer simulations and problem-solving in probability...binary counting...regression analysis. Practice programs, art and graphing problems, program listings and sample runs are included, plus over 250 problems, puzzles and programming ideas.

8½" x 11", softcover, illustrated.
$15.95 ($2.00) #12D

For faster service, ***PHONE TOLL FREE: 800-631-8112*** (In NJ only: 201-540-0445)

Also available at your local bookstore or computer store.

CREATIVE COMPUTING PRESS • Dept. NZ2F 39 East Hanover Avenue • Morris Plains, NJ 07950

Please send books listed below.

Book No.	Qty.	Title	Price Each	(P&H) Each	Total Price
	CA, NJ and NY State residents add applicable sales tax				
Postage and handling charges appear in parentheses ( ) next to price of book			TOTAL AMOUNT		

☐ PAYMENT ENCLOSED $_____ Outside USA add $3.00 per order.

☐ CHARGE MY: (Charge and phone orders $10 minimum.)
☐ American Express ☐ MasterCard ☐ Visa

Card No._____ Exp. Date_____

Signature_____

Mr./Mrs./Ms._____
(please print full name)

Address_____ Apt._____

City_____

State/Zip_____

☐ Send me a FREE *Creative Computing* Catalog.

COMING UP

A LIBRARY OF SOFTWARE PROGRAMS FOR THE IBM PERSONAL COMPUTER

PC DISK MAGAZINE

A Member of the Ziff-Davis Family of IBM PC Magazines

LABEL MAKER

If your personal or professional mailing list has degenerated into a motley assortment of tattered scraps overrunning your Rolodex, the time has come to seek help. With *LABEL MAKER* you can manage and store any kind of list. Format tens of thousands of addresses to fit your label stock. Sort them alphabetically, up to 5,000 at a time. Display and edit the data, making additions, deletions, or alterations at will. At home or in the office, you can become a pro at managing your mailing list.

FILE MANAGER III

Parts I and II of our disk management utility allowed you to list, rename, copy, or delete the files on a disk, search for particular files, and print them in an adjustable format. The final program in the series saves you even more time and effort by enabling you to list your files on the screen in whole or in part. You no longer have to guess what your filename means or print the entire file to discover its contents. Use the complete *FILE MANAGER* package to display a file, scan through it, save portions to another file, or print it.

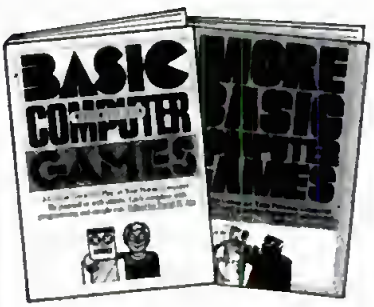
JIG JAGS 3

Test your spatial and verbal dexterity with three new samples of our hybrid jigsaw-crossword puzzle game. The object is to position 16 crossword puzzle pieces on a 49-square jigsaw puzzle grid. There is only one correct way to arrange the pieces so that they form words both across and down, and there are no written clues to help you guess. It takes luck and skill to reconstruct the valid crossword puzzle, and the program rates your skill level based on the amount of time and help you require. This is the final installment of our ingenious new computer game.

PRINT FORMATTER

Everyone knows that graphics and varied typefaces make printed matter more noticeable and readable. *PRINT FORMATTER* simplifies the process of creating them by letting you insert single-character codes directly into the text that you send to the printer. When used with the IBM/Epson or Okidata printers, these codes activate the various printer features. In addition, actual control codes can be inserted in ASCII form or as the characters themselves.

GAME BOOKS FROM CREATIVE COMPUTING



BASIC COMPUTER GAMES, Microcomputer Edition, edited by David H. Ahl. Here's a great collection of 101 fascinating games, all written in easy-to-use Microsoft BASIC. Play Craps, Combat, Super Star Trek, Lunar LEM Rocket, Gomoko, Checkers, Boxing, Bowling–and 93 others! With an introduction, notes on Microsoft BASIC, and conversion instructions for other BASICs, 8¼" x 11", softcover, illustrated, with an index. 183 pp. $7.95 ($1.50) **#6C**

MORE BASIC COMPUTER GAMES, edited by David H. Ahl and Steve North. In this sequel to *Basic Computer Games* you'll find 84 challenging new games, complete with sample runs, program listings and illustrations. All run in Microsoft BASIC. Race your Ferrari, become a millionaire, joust with a knight, crack a safe, and more! Conversion table to other BASICs included. 8¼" x 11", softcover, illustrated, 200 pp. $7.95 ($1.50) **#6C2**
TRS-80 Microcomputer Edition, $7.95 ($1.50). **#6C4**

TRS-80 is a registered trademark of the Radio Shack Division of Tandy Corp

CREATIVE COMPUTING PRESS Dept. NX3C
39 East Hanover Avenue, Morris Plains, New Jersey 07950

Send me the books listed below

ITEM NO	QTY	TITLE	PRICE EACH	P&H* ( )	TOTAL
		CA, NJ and NY residents add applicable sales tax			
				TOTAL AMOUNT	

Outside USA add $3 for regular postage and handling per order

CHECK ONE
☐ PAYMENT ENCLOSED $_____
☐ CHARGE MY
☐ American Express ☐ MasterCard ☐ Visa
(Charge and phone orders $10 minimum)

Card No._____ Exp Date_____

Mr Mrs Ms._____
(please print full name)

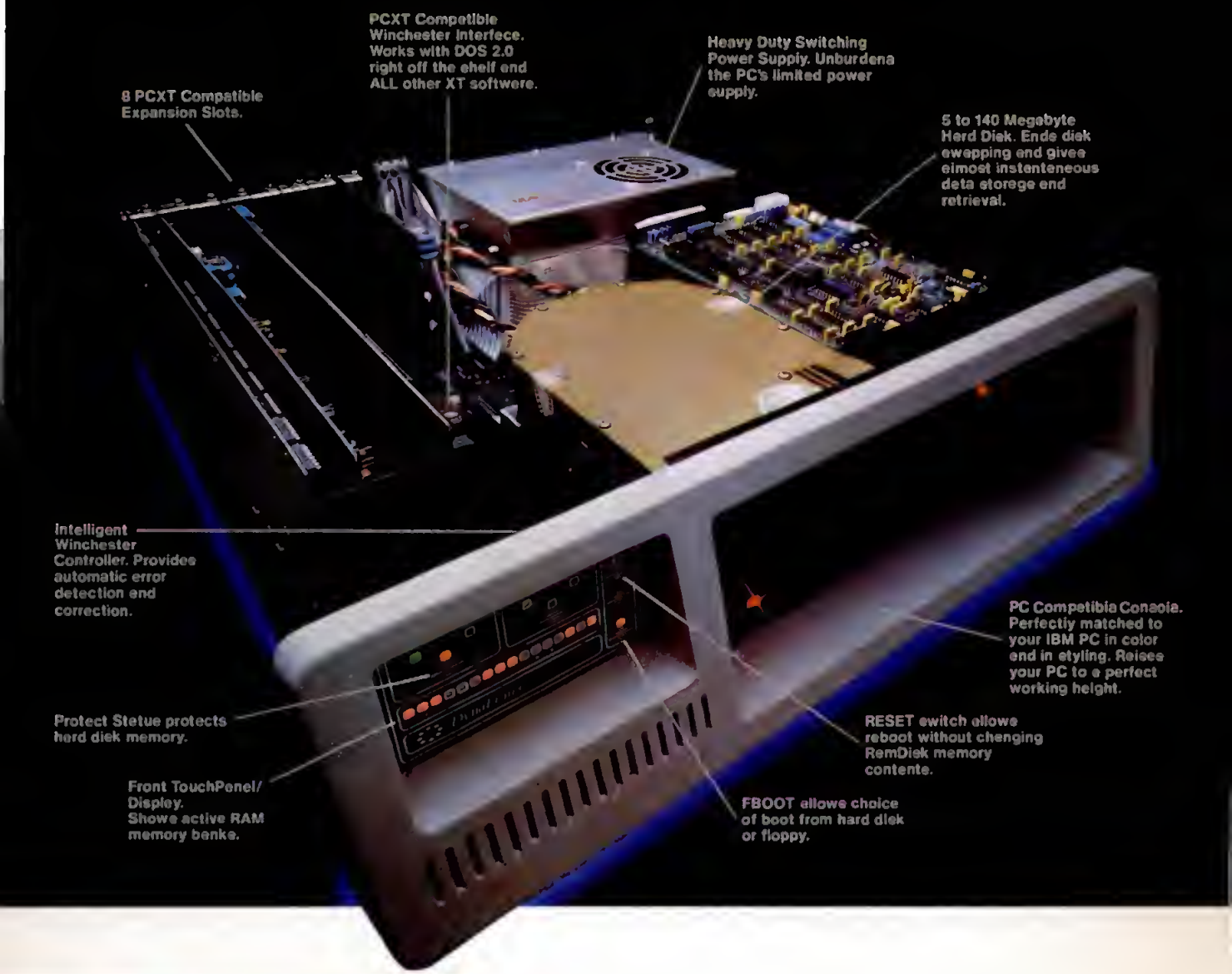
Address_____ Apt_____

City_____

State_____ Zip_____

For faster service **CALL TOLL FREE: 800-631-8112.**
(In NJ call 201-540-0445)
Also available at your local bookstore or computer store.

DYNAFRAME



Turn Your PC Into an XT+!

DynaFrame is a combination of a hard disk drive with your choice of storage capacity (from 5 to 140 Megabytes ...8 PCXT compatible expansion slots... high speed backup and added control through the Front Touch Panel/Display. And, unlike many other sub-systems, DynaFrame is totally compatible with IBM XT software...no software patching is needed!

You have your choice of several back-up systems. Select from a 5 or 10 megabyte removable hard disk drive . . . a high density floppy disk drive . . . or a 25 megabyte streamer tape.

See the new DynaFrame at your local computer specialist or write for detailed information.

IBM PC and IBM XT are trademarks of International Business Machines. DynaFrame is a trademark of Vista Computer Co., Inc.

Vista COMPUTER COMPANY, INC.
1317 E. Edinger Avenue, Santa Ana, CA 92705
(714) 953-0523

CIRCLE 178 ON READER SERVICE CARD

© 1983 Vista Computer Co.

Index To Advertisers

RS #	Advertisers	Page
114	Advanced Computer Products	343
113	Advanced Computer Products	292
194	Alpha Software Corporation	3
195	Alpha Software Corporation	2
105	Amdek Corporation	C-2
117	Ann Arbor Software	14
174	Apparat	224
*	Apparat	225
120	Applied Computer Products Corp.	88-89
246	Apstek Inc.	216
244	Artic Technologies	288
128	Artificial Intelligence Research Group	354
102	Artronics	48
116	Ashton-Tate	30
209	Ashton-Tate	63
103	AST Research	197
104	AST Research	196
101	AST Research	82-83
156	Atron	58
175	Automated Business Machines	291
107	Automated Training Systems	276
257	Balis Computers	257
212	Belanger Research	252
160	Beta Tool Systems	275
150	Blaise Computing Inc.	305
*	Borland International	45
*	Borland International	191
213	Bottom Line	77
153	Business Tectonics	305
371	C Source	257
238	Certiflex	270-271
123	Chang Laboratories	26-27
228	Compu Add Corp.	190
172	Compucable	391
199	Compucart	258
205	Compuclassics	360
234	Compumail	375
457	Compusave	298
226	Compuserve	79
192	Computer Control	284
125	Computer Discount Products	327
183	Computer Mail Order	320-321
135	Computer Warehouse	286
316	Connecticut Software	376
317	Connecticut Software	311
318	Connecticut Software	296
121	Contemporary Computerware	396
165	Control Data Corp.	241
215	Corona Data Systems	138-139
216	Corona Data Systems	136-137
126	Conroy-LaPointe	72-73
202	Creative Computer Products	308
371	C Source	257
*	Curtis Manufacturing	97
515	Data Sources	319
118	Data South	269
305	Decision Data	289
221	Decision Resources	39
137	Dennison Computer Supplies, Inc.	67
186	Desert Technologies	387
307	Diamond Software	71
444	Digital Communications	32-33
*	Diskette Connection	396
136	Disk World	388
161	DunsPlus	395
243	Dysan Corporation	1
235	Eastern Enterprises	385
118	Economy Software	249
220	Ecosoft	297
241	Financier Inc.	9
133	Flagstaff Engineering	78
139	Floppy Disk Services	66
242	47st Photo	328-329
306	Funk Software	65
250	FTG Data Systems	234
252	Garden of Eden	274
255	Gem Electronics	380
260	H&E Computronics	398
198	Harvard Associates	297
166	Hayes Microcomputer Products	150-151
266	Heath Company	300-301
247	Helix Laboratories, Inc.	294
*	Hercules Computer	8
*	Hercules Computer	85
140	Hewlett-Packard	187
163	Houston Instruments	112
164	IBM ISG Division	40
269	IBM Sales Support Division	193
110	Innovative Data Technology	188
272	Innovative Software	293
269	I OMEGA Corporation	56
171	ISM	307
168	Jameco Electronics	283
289	Keytronics, Inc.	108
276	Laboratory Microsystems	346
303	Le Baugh Software	266
385	Lifetree	268
295	Logicsoft	257
282	Logicsoft	260
296	Logicsoft	354
130	Logic Unlimited	231
263	Macola Inc.	374
386	Magnum PC	377
148	Marc Software	95
432	Martin Marietta Data Systems	233
437	Maynard Electronics	230
290	MCP Applications	304
345	Memorex	92-93

INDEX TO ADVERTISERS

RS #	Advertisers	Page
265	Microcentre	149
*	Micro Computer Accessories	90
315	Micro Flash Computer Systems	199
181	Micrografx	263
516	Microlog, Inc.	158
201	Micromail	344
478	Micromart	42
158	Micromart	358-359
301	Micro Match	44
337	Microshop	290
*	Microsoft	25
*	Microsoft	104-105
*	Microsoft Press	102
422	Micro Storehouse	371
327	Microstuf, Inc.	109-111
321	Microstuf, Inc.	310
343	Microtrivia	281
331	Micro Ware	52
341	Micro Xpress	253
340	MLI Microsystems	396
127	Morningstar Systems	397
275	National Product Marketing	240
805	National Product Marketing	396
*	NEBS	387
170	NEC Information System, Inc.	211
346	Norton Utilities	103
467	O'Hanlon Computer Systems	194
279	Omega Software	283
323	Omni Data Systems	374
285	Orange Micro	38
122	Orchid Technologies	28
351	ORYX	74-75
363	ORYX August Specials	74-75
527	Palantir	312
484	Paradise Systems, Inc.	76
288	PC Brand	68-69
310	PC Brand	50-51
339	PC Connection	238-239
348	PC Demo	288
821	PC Horizons	370
364	PC Limited	353
535	PC Network	254-255
352	PC Software Interest Group	276
365	Persoft	259
531	Personal Computer Products	368
530	Physical Sciences	374
268	Picotronics	347
143	Pipeline Computers	350-351
309	Prentice Hall	20-21
147	Prentice Corp.	203
299	Princeton Graphic Systems	22
372	Professional Software Inc.	23
366	Progressive Micro Distributers	373
203	Quadram Corp.	12-13
251	Quadram Corp.	24
353	Qualitas	256
334	Qubie Distributing	11
383	Qubie Distributing	113
384	Qubie Distributing	208
227	Qubie Distributing	46-47
354	Quentin Research	355
493	Quest Research, Inc.	31
387	ReadiWare Systems	369
420	RealWorld Software	5
388	Realia, Inc.	374
391	RGB Display Corp	55
182	Rogue River Software	234
488	Romar	322
438	Rosesoft	61
443	R.T.C.S. Corp.	70
*	Safeware	346
149	Satellite Software International	10
470	SBT Corp	16
447	Screen Data Corp.	4
187	Sigma Designs	148
184	Softcraft Inc.	96
*	Softline	98
453	SOFTMAN	84
423	Software Banc	116
473	Software Building Blocks	275
466	Software Dynamics	70
393	Software Link Inc.	264
193	Software Solutions	114-115
396	Star Micronics Inc.	200
430	STB Systems Inc.	C-3
224	Strategic Software Systems Inc.	250
434	Strictly Software	372
448	Structured Consulting Services	370
431	STSC Inc.	207
492	Sum Data Systems	267
474	Sysgen, Inc.	80
461	SysteMate Inc.	86
441	Systems Management Associates	378
445	Tallgrass Technologies	29
375	TAVA PC	213
501	Tecmar Inc.	156-157
502	Tecmar Inc.	C-4
504	Telebyte	352
204	Telesoft	306
424	Thoughtware Inc.	272-273
802	Titan Technologies	34
507	Touchstone Technology Inc.	106
810	Unisource	53
498	U.S. Robotics Inc.	204
178	Vista Computer Company Inc.	392
460	Walonick Associates	288
*	Warehouse Software	147
522	WCCI	282
211	X.D.S. Manufacturing	386
210	Zanthe	302
824	ZyLAB Corp.	19

Looking for Micros to Grow On?

Check Out DunsPlus.
First Hand.
At a DunsPlus Open House.

Look what you get with DunsPlus:

All this, and more — fully integrated into the DunsPlus offering.

Take a closer look.
For end users, DunsPlus is remarkably simple to use. With the DunsPlus Main Menu, selection and movement between software applications and data bases are single-button fast. A few simple keystrokes are all it takes to access and transfer data between products and services linked to the system.

And we provide two full days of education to guarantee that DunsPlus is immediately usable by your business managers — the day it is delivered.

What can *you* get with DunsPlus?
You'll be able to provide a micro that gives your end users the micro-computing power they've asked for . . . with ease of use they never imagined possible.

And you'll have a system with the flexibility to ensure that the PC you recommend today will help you implement your information management strategies of tomorrow.

You decide. Plan to attend one of these free DunsPlus Open Houses and see for yourself.

San Francisco: August 23
Los Angeles: September 12
Stamford, CT: September 12
New York: September 25 or 26
Chicago: October 3

To experience DunsPlus first hand or to find out more about us, call today

800-DNB-PLUS

DunsPlus

a company of The Dun & Bradstreet Corporation

IBM is a registered trademark of International Business Machines Corporation.
1-2-3 is a trademark of Lotus Development Corporation
MultiMate is a trademark of MultiMate International, Inc., which identifies a proprietary product
DunsPlus is a trademark of DunsPlus, Inc., a company of The Dun & Bradstreet Corporation.

CIRCLE 161 ON READER SERVICE CARD

WANTED

"Buyers" & We'll pay the shippin'

•CALL FREE (800) 654-4058•

"Call For Reduced Prices At Various Quantities"

REDUCED CALL

Verbatim.

5¼" sin·side dbl·den.	2.40
5¼" dbl·side dbl·den.	3.45
5¼" sin·side quad	3.20
5¼" dbl·side quad	4.40
8" sin·side sin·den.	2.75
8" sin side dbl·den	3.[illegible]
8" dbl side dbl·den	3.40

Dysan CORPORATION

5¼" sin·side dbl·den.	3.20
5¼" dbl·side dbl·den	4.[illegible]
5¼" sin·side quad	4.[illegible]
5¼" dbl side quad	4.95
8" sin·side sin·den	3.45
8" sin side dbl·den	4.[illegible]
8" dbl side dbl·den.	4.95

3M Scotch

5¼" sin·side dbl·den.	2.20
5¼" dbl side dbl·den.	3.20
8" sin·side sin·den.	2.35
8" sin·side dbl·den.	2.95
8" dbl·side dbl·den.	3.90

Head Cleaning Kits.... 5.20
Refills. 9.55

We Stock "Bulk-Packed" Diskettes

Disk Minder
•Smoked Plastic
•Holds 75 Disks
16.75 ea

Prices per ea. 10 per box

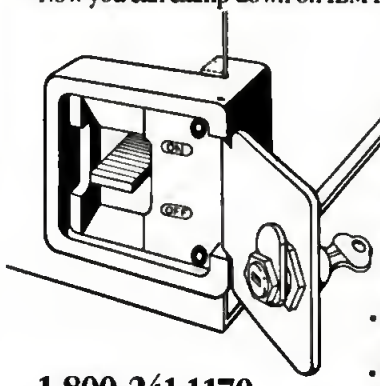
Dealer Inquiries Welcomed

the Diskette Connection™
P.O. Box 1674 Bethany, OK 73008

*(Continental US only. Add 3.00 on orders under 40.00)

Mom gets tough with PC/SECURE.™

Now you can clamp down on IBM PC/PC XT protection.



- Impenetrable rigid cast aluminum
- Install in minutes, no special tools
- Lock up power switch and case cover
- User privacy guaranteed
- Expansion boards stay where they should be

1-800-241-1170

MOM™

MOM and PC/Secure are trademarks of National Product Marketing, Inc.
Two Northside 75, Atlanta, GA 30318 404/351-2902

CIRCLE 805 ON READER SERVICE CARD

Contemporary ComputerWear

DUST COVERS FOR THE IBM PC

Attire your IBM PC in style! **ComputerWear** is dust protection with class. Design features include select, woven fabric and embroidered emblem. Order now. Satisfaction guaranteed.

☐ YES, PROTECT MY PC IN STYLE! SEND ME: ☐ CHECK

___ Keyboard(s)	$16	___ Monitor(s)	$18
___ Drive(s)	$18	___ Printer(s)	$18
___ 1pc Mon/Drive	$36	Add $2.00 Shipping	

☐ VISA ☐ MC

Total: $_____ (CA Res. add tax)

Print Name: _____

Address: _____

City/State: _____ Zip_____

Credit Card #: _____ Exp._____

Signature _____

Contemporary ComputerWear Att: EM
1320 36th Ave./San Francisco, CA 94122 • 415/564-0506
IBM PC is a trademark of International Business Machines Inc.

CIRCLE 121 ON READER SERVICE CARD

DISK MECHANIC™

The ULTIMATE Backup, Analyze & Repair Utility
The Disk Toolkit NO IBM PC Should be Without
Protects Your Software Investment

BACKUP TOOLS:
- Can Backup Most Every Diskette
- SUCCEEDS where others fail!
- Works Manually or Automatically
- Creats "Protected" Diskettes
- Many Additional Analysis Tools

FILE TOOLS:
- Show Disk & File Allocation
- Display & Alter File Data
- Repair Damaged Disks
- Recover Erased Files
- Alter "Hidden" Status
- Search Files For Data

SECTOR TOOLS:
- Examine/Print Sector Data
- Modify (ZAP) Sector Data
- Compare, Copy & Zero Sectors
- Search Sectors For Data

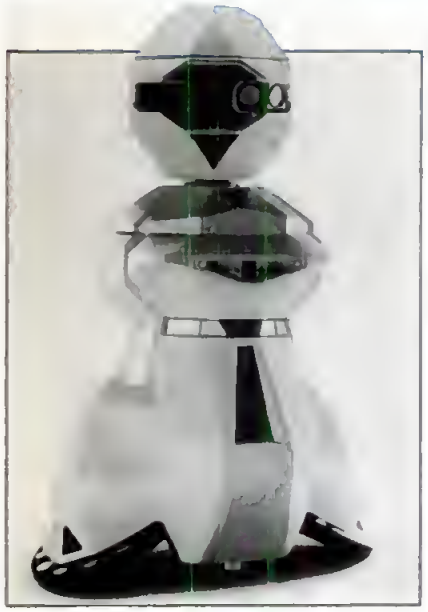
HACKER TOOLS:
- Modify Floppy Disk Controller Parameters
- Supports All FDC R/W Commands

DISK MECHANIC works with all standard IBM PC disk formats including "protected" diskettes with mixed track and sector sizes, blank and high track formatting, CRC errors, and single or double sided drives. DISK MECHANIC requires an IBM PC with 128K of memory or COMPAQ with 192K of memory, DOS 1.10, and 2 floppy disk drives. DISK MECHANIC includes a detailed 48 page instruction manual. To Order DISK MECHANIC send check or money order for $70 plus $3 for shipping (Mass. res. add sales tax.) to: MLI MICROSYSTEMS, Box 825, Framingham, Mass. 01701 or Call (617) 926-2055 for Mastercard or VISA orders. Dealer/Distributor inquiries welcome. ©1983 MLI MICROSYSTEMS.

MLI MICROSYSTEMS

CIRCLE 340 ON READER SERVICE CARD

Coming Up



Process Control

PCs are not only helping managers with budgeting and planning, they are now teaching robots and helping to run assembly lines. We'll take a look at three robots that the PC has trained, as well as several factories using PC-XTs, uniquely altered to stand up to the conditions on a factory floor, to keep their assembly lines operating smoothly from start to finish.

Project: Database, Part 6

This sixth article in the ongoing series reviewing DBMS packages looks at Category 3, *dBASE II*-type databases. More sophisticated than the second category of databases, these packages can handle more than one file at a time, feature a query language, and can be programmed. In this issue, we'll review *dBASE II*, the de facto standard of DBMS packages, and look at some other packages that challenge that standard.

Microsoft FORTRAN Compiler

In olden days, FORTRAN was the domain of scientists, engineers, and statisticians and was used only on mainframes. Now, a high-quality compiler is available to help translate sophisticated FORTRAN programs for mainframes to a PC-usable form. Not only that, programs written in this version of FORTRAN can run, with few modifications, on many mini- and mainframe computers. We'll tell you all about how the compiler works and how it can help you use sophisticated mainframe programs without breaking the bank.

Monroe 2000, Tandy 2000

The Monroe 2000 and the Tandy 2000 microcomputers are attempting to stand apart from the crowd of PC-compatibles. Do these two 80186-based micros have enough capabilities and advantages to warrant choosing them over the IBM PC, its clones, and all the software written for them?

Professional tools for the software developer and business system user.

ProTools™

MORNING STAR SYSTEMS, INC.

ProLibrary

Professional C Compiler Tools

These tools go beyond access to ROM Video and DOS 2.0 functions. Tools to write 8088 interrupt handlers and DOS 2.0+ device drivers. Flexible segment: offset addressing functions. DOS 2.0+ path handlers, set environment, run-time batch commands, and execution executive. DOS 3.0 upgrade. Lattice 2.0 compatible.

ProBatch

Professional Batch Tools

Sophisticated batch commands to control job execution. chmod to change or display file attributes. when to control job execution by time, day or date. ifset/switch/case to control job execution sequence. pr for flexible file printing. mount to access floppy disks by volume id. Many other powerful batch commands. All commands may be piped. All commands use 2.0 path. All commands controlled by set environment.

ProScreen

Professional Screen Manager

Editor for creation and management of screens. Screen storage in file or in program. Data entry screens, menus, windows and on demand help. Forms and box generation. On screen buttons and graphic/mono icons. Mouse and light pens supported. Run-time access by LINK library or by interrupt function.

ProLibrary (Includes Source) $200.00
ProBatch $200.00
ProScreen $300.00
ProScreen (with C Source) $450.00
MicroSoft C Compiler $400.00
Lattice C Compiler $400.00

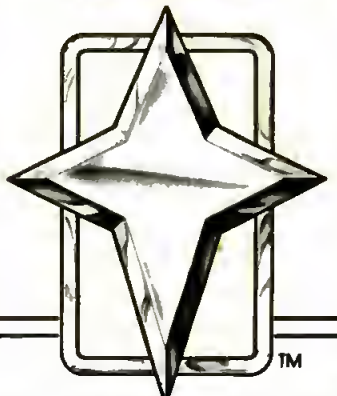
Shipping & Handling Additional/ VA Residents 4% Sales Tax/ MC/VISA COD/ Check-OK

(703) 425-6422

Dealer Inquiries Welcomed

MORNING STAR SYSTEMS, INC.

9202 Alyssum Way
Annandale, VA 22003



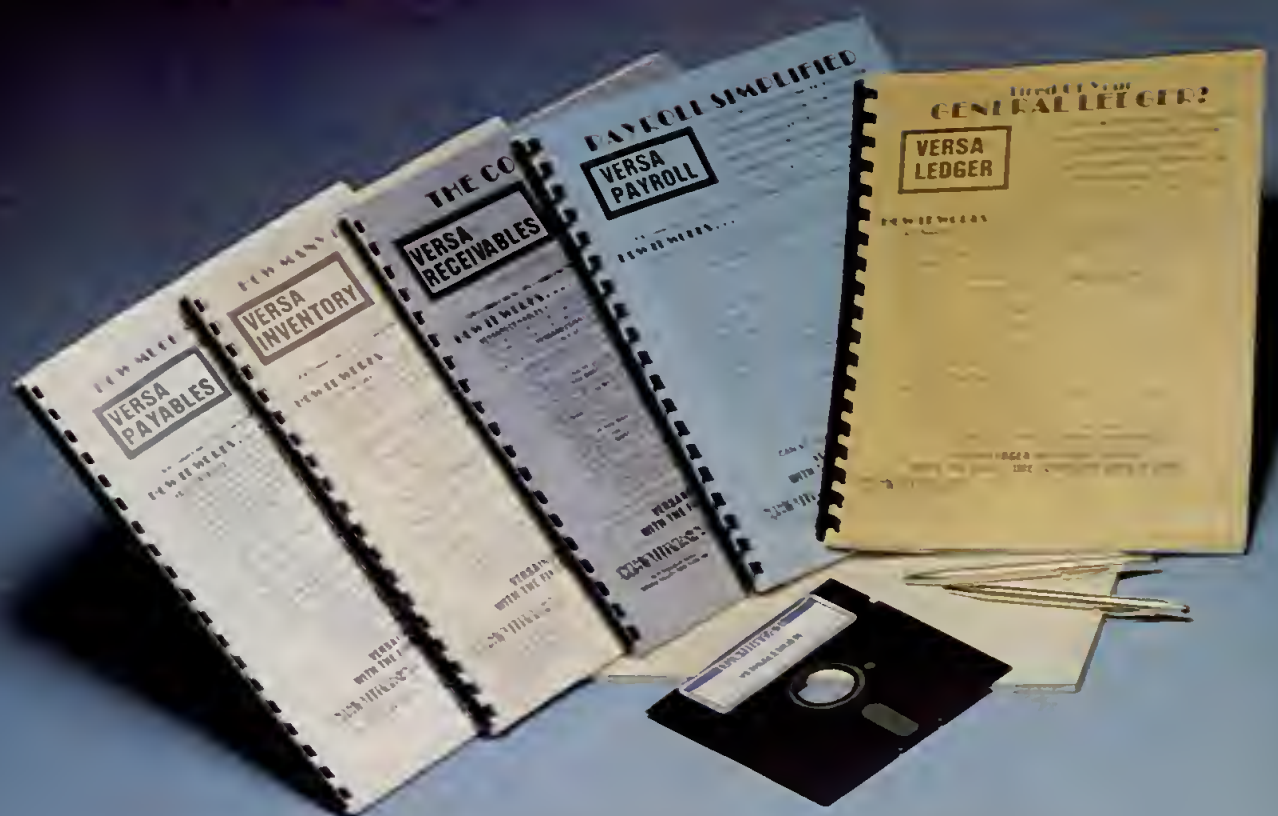
TM

397

CIRCLE 127 ON READER SERVICE CARD

Introducing the Most Powerful Business Software Ever!

TRS-80™ (Model I, II, III, or 16) • APPLE™ • IBM™ • OSBORNE™ • CP/M™ • XEROX™



The VERSABUSINESS™ Series

Each VERSABUSINESS module can be purchased and used independently, or can be linked in any combination to form a complete, coordinated business system.

VERSARECEIVABLES™ $99.95

VERSARECEIVABLES™ is a complete menu-driven accounts receivable, invoicing, and monthly statement-generating system. It keeps track of all information related to who owes you or your company money, and can provide automatic billing for past due accounts. VERSARECEIVABLES™ prints all necessary statements, invoices, and summary reports and can be linked with VERSALEDGER II™ and VERSAINVENTORY™.

VERSAPAYABLES™ $99.95

VERSAPAYABLES™ is designed to keep track of current and aged payables, keeping you in touch with all information regarding how much money your company owes, and to whom. VERSAPAYABLES™ maintains a complete record on each vendor, prints checks, check registers, vouchers, transaction reports, aged payables reports, vendor reports, and more. With VERSAPAYABLES™, you can even let your computer automatically select which vouchers are to be paid.

VERSAPAYROLL™ $99.95

VERSAPAYROLL™ is a powerful and sophisticated, but easy to use payroll system that keeps track of all government-required payroll information. Complete employee records are maintained, and all necessary payroll calculations are performed automatically, with totals displayed on screen for operator approval. A payroll can be run totally, automatically, or the operator can intervene to prevent a check from being printed, or to alter information on it. If desired, totals may be posted to the VERSALEDGER II™ system.

VERSAINVENTORY™ $99.95

VERSAINVENTORY™ is a complete inventory control system that gives you instant access to data on any item. VERSAINVENTORY™ keeps track of all information related to what items are in stock, out of stock, on backorder, etc., stores sales and pricing data, alerts you when an item falls below a preset reorder point, and allows you to enter and print invoices directly or to link with the VERSARECEIVABLES™ system. VERSAINVENTORY™ prints all needed inventory listings, reports of items below reorder point, inventory value reports, period and year to-date sales reports, price lists, inventory checklists, etc.

VERSALEDGER II™ $149.95

VERSALEDGER II™ is a complete accounting system that grows as your business grows. VERSALEDGER II™ can be used as a simple personal checkbook register, expanded to a small business bookkeeping system or developed into a large corporate general ledger system **without any additional software.**

- VERSALEDGER II™ gives you almost unlimited storage capacity (300 to 10,000 entries per month, depending on the system),
- stores all check and general ledger information forever,
- prints tractor-feed checks,
- handles multiple checkbooks and general ledgers,
- prints 17 customized accounting reports including check registers, balance sheets, income statements, transaction reports, account listings, etc.

VERSALEDGER II™ comes with a professionally-written 160 page manual designed for first-time users. The VERSALEDGER II™ manual will help you become quickly familiar with VERSALEDGER II™, using complete sample data files supplied on diskette and more than 50 pages of sample printouts.

CIRCLE 260 ON READER SERVICE CARD

SATISFACTION GUARANTEED!

Every **VERSABUSINESS™** module is guaranteed to outperform all other competitive systems, and at a fraction of their cost. If you are not satisfied with any **VERSABUSINESS™** module, you may return it within 30 days for a refund. Manuals for any **VERSABUSINESS™** module may be purchased for $25 each, credited toward a later purchase of that module.

To Order:

Write or call Toll-free (800) 431-2818
(N.Y.S. residents call 914-425-1535)

- add $3 for shipping in UPS areas
- add $4 for C.O.D. or non-UPS areas
- add $5 to CANADA or MEXICO
- add proper postage elsewhere

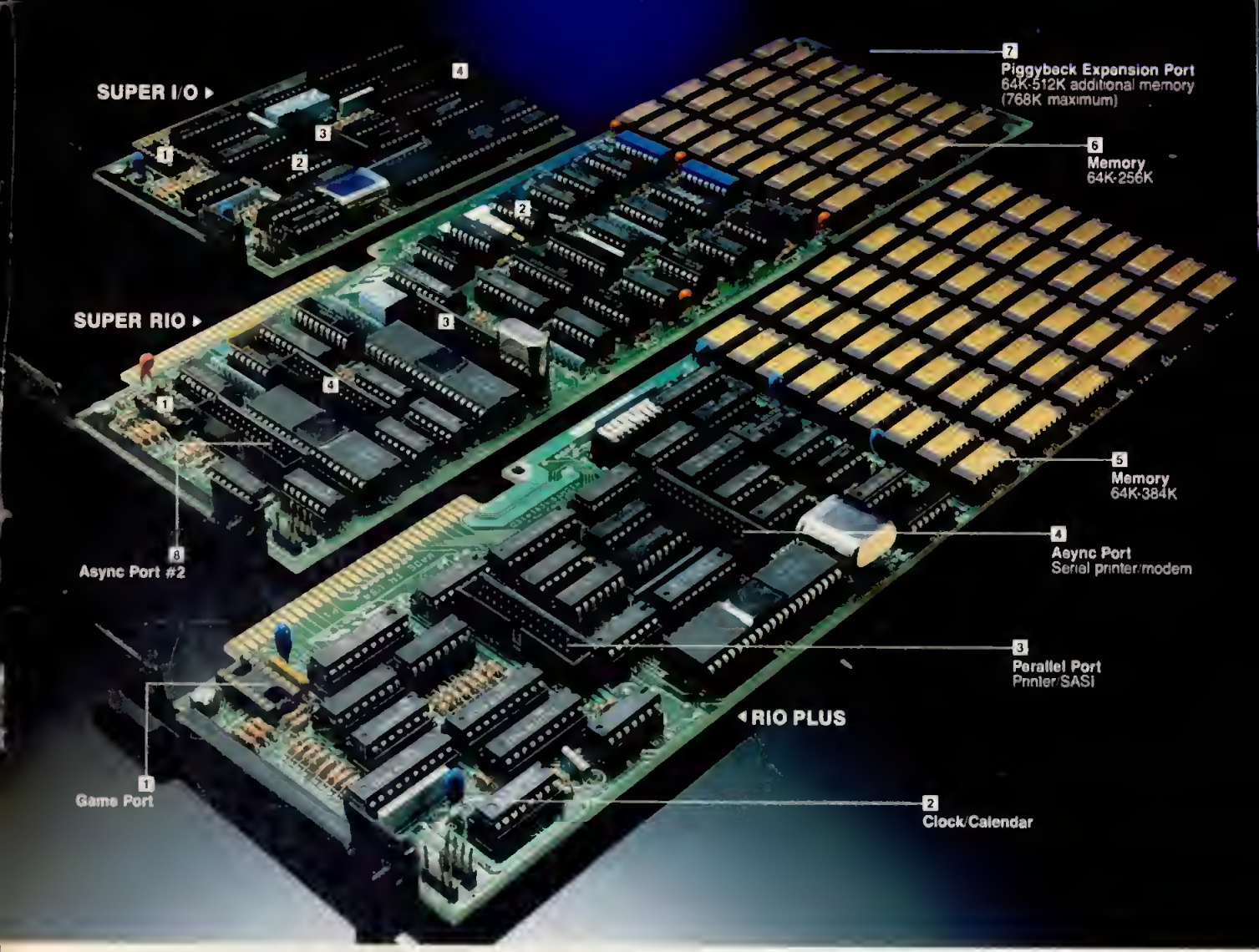
DEALER INQUIRIES WELCOME

All prices and specifications subject to change / Delivery subject to availability

COMPUTRONICS INC

50 N. PASCACK ROAD, SPRING VALLEY, N.Y. 10977

* TRS-80 is a trademark of the Radio Shack Division of Tandy Corp. *APPLE is a trademark of Apple Corp. *IBM is a trademark of IBM Corp. *OSBORNE is a trademark of Osborne Corp. *CP/M is a trademark of Digital Research. *XEROX is a trademark of Xerox Corp.



What you get out of your IBM PC/XT depends on what you put into it.

The versatile multi-function boards from STB offer more functions and more memory.

If your personal computing applications have outgrown your personal computer's hardware, there's a smart way of expanding your system while still leaving plenty of room to grow.

The secret is the line of multi-function boards from STB.

Our SUPER RIO™ combines two asynchronous RS-232-C serial communication ports for interfacing modems, serial printers, plotters, mice, and an almost limitless list of other peripherals, a parallel I/O port for interfacing printers and hard disk controllers, a battery operated clock/calendar that remembers the date and time even when your system is turned off, a game paddle port that can use either APPLE™ or IBM™ compatible joysticks, and up to 256K of additional memory.

The STB Piggyback™ board adds up to 512K more memory onto the SUPER RIO for a total of 768K. And the pair uses only one expansion slot.

Included free with the SUPER RIO board is the PC Accelerator™, which combines printer buffering and high speed disk emulation into one easy to use program.

Our RIO PLUS™ board includes all of the I/O functions of the SUPER RIO (less one serial port) with on board memory expansion capability of up to 384K. When used with a 256K computer, this board gives your system a full 640K of memory. Of course, PC Accelerator is also included with every RIO PLUS.

If you already have enough memory, the STB SUPER I/O™ board adds a parallel I/O port, serial port, game port, clock/calendar and PC Accelerator to your system. And, its small enough to fit in a short slot on the XT.

As new functions and applications arise, you can count on STB Systems to provide convenient, affordable ways to adapt these innovations to your system.

Compare our quality products at your local dealer, or for more information please write or call us.

Expanding Microcomputing

STB™

STB Systems, Incorporated

601 North Glenville, Suite 125
Richardson, Texas 75081/(214) 234-8750

All STB multi function boards include a serial and parallel cable
Apple is a registered trademark of Apple Computers Inc.
IBM is a registered trademark of International Business Machines Corporation
PC Accelerator is a registered trademark of ResCorp.

©1983 STB Systems, Inc.

CIRCLE 430 ON READER SERVICE CARD

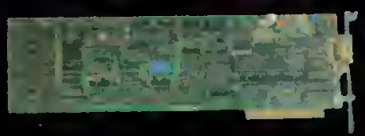
WHAT A PAIR !

Tecmar's Graphics Master™ & Lotus 1-2-3

Graphics Master is the only board that creates *both monochrome* and *color* graphics for Lotus 1-2-3.
You can also run IBM compatible software because Graphics Master emulates both the IBM Color Graphics Adapter and the Monochrome Adapter.
We are pleased to announce that Graf-Talk[2] and MetaWindow[3] software take full advantage of Graphics Master's high resolution graphics.

Graphics Master is the only board that will do all of the following with appropriate software:

- High resolution color graphics - 640 x 400, 16 colors
- High resolution monochrome graphics - 720 x 700
- Run software for IBM Monochrome Adapter
- Run software for IBM Color Graphics Adapter



TECMAR
the power behind the PC

Tecmar Inc. 6225 Cochran Road Solon (Cleveland), Ohio 44139-3377 Phone:(216)349-0600 Telex: 466692

1 Registered Trademark of the Lotus Development Corp. 2 Registered Trademark of the Redding Group Inc. 3 Registered Trademark of the Metagraphics Corp.

CIRCLE 502 ON READER SERVICE CARD